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A STUDY OF THE SCORCHING CHARACTERISTICS OF FABRICS*

WASHINGTON SECTION

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A technique for scorching fabrics by contact with a heated metal surface and measuring the color change produced has been developed. A series of experiments in which undyed fabrics made from a number of different fibers were heated at various temperatures and periods of time show the method to be a convenient means of studying and comparing the scorching characteristics of textile materials and finishing treatments. Fabrics were found to scorch more rapidly in contact with heated metal than in air, but both methods were shown to rank fabrics in the same general order. Results indicate that scorching is more dependent on the chemical nature of the fiber or finishing treatment than on the physical form of the fiber or fabric.

INTRODUCTION

IN his famous and thought-provoking Marburg Lecture, Harold DeWitt Smith (*19*) lists "Scorching" as one of the fundamental characteristics of a textile fiber. According to Webster "scorch" means "to heat so as to change color and texture without consuming". A review of the literature on heat resistance shows that data are available on the melting and fusing temperatures of thermoplastic fibers. Work has also been done on strength loss of industrial fabrics exposed to prolonged heating at moderate temperatures. Little information exists, however, on the changes in fabric appearance resulting from short periods of heating at relatively high temperatures. What little is available on the subject is mostly qualitative and restricted largely to the natural fibers. The purpose of this study was to develop a method for evaluating and comparing the scorching characteristics of textile materials.

Fabrics during finishing are exposed to the relatively high temperatures of drying, curing and pressing. Heat is applied to the material by hot air, as in the case of tenter frames and loop dryers, or by hot metal surfaces of drycans, calender rolls, palmer dryers and pressing machines. Garments and household textiles are subjected to repeated cycles of ironing, pressing and drying throughout their service life. In all such operations whether in the finishing plant, home or laundry, avoidance of discoloration and change in texture due to overheating is of primary importance.

Millmen, consumers, launderers, and drycleaners have all learned from long years of experience how to handle fabrics made from the natural and older synthetic fibers. Such experience is lacking, however, for the newer man-made fibers and the ever-increasing number of special finishes now being applied to fabrics made from all types of fibers and blends. For instance, the high temperatures required in heat setting and resin curing present new problems to the finisher. Manufacturers of laundry dryers, flat irons and home tumble-dryers need information to guide them in the design of new equipment. The housewife is confused by the multiplicity of special washing and ironing instructions for the new fabrics and finishes and frequently learns "the hard way" how to care for them.

A technique has been worked out for scorching fabrics in contact with a heated metal surface and measuring the resulting color change. The experiments described herein are presented primarily for the purpose of demonstrating the practical application of the method. Briefly, it consists of heating a sample of the fabric between metal plates at various temperatures and periods of time, measuring the color change as compared to the original fabric with a photo-electric optical device, and plotting the resulting data for easier interpretation. The application of this technique and the results obtained will now be described in more detail.

TEST METHODS

SCORCHING PROCEDURE———

A Standard AATCC Scorch Tester was used for the samples scorched by contact with heated metal surfaces. The instrument, produced by Atlas Electric Devices Co, is shown in Figure 1, and is the same as specified in the AATCC Chlorine Retention Test, 69-52. The Scorch Tester, originally designed and developed by the late Jack Epelberg of Cluett, Peabody & Co, consists of a pair of thermostatically controlled, electrically heated metal plates (1″ x 4″) hinged and weighted so that a test specimen may be pressed between them at a definite temperature under a definite pressure.

The upper and lower plates were always held at the same temperature, and the dial thermometers on the instrument were used to adjust and maintain the temperature within limits of ± 5°F. These were checked by thermocouple over a range of temperatures and found to be accurate within 1%.

A preliminary series of experiments showed that, under the conditions of this study, variations in fabric moisture had little or no effect on scorching. Samples conditioned at 65% RH or stored over calcium chloride or over water in a desiccator for a week showed no appreciable difference. However, experiments were carried

* Presented by Nelson F Getchell on September 15, 1956 at the Waldorf-Astoria, New York, NY, during the Perkin Centennial.

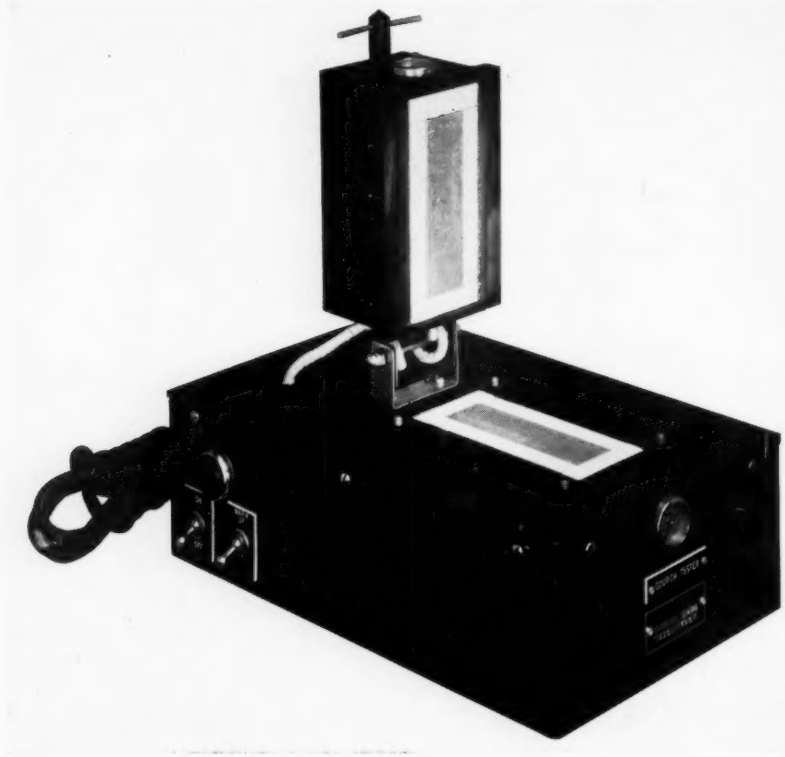


Figure 1
The Scorch Tester

out in an air-conditioned atmosphere so that no large differences in fabric moisture content were encountered during the study.

The effect of increased pressure on the upper plate was checked by doubling and tripling the weight beyond the original 9 oz. It was found to have no appreciable effect on the results. Pressure on the samples during scorching was maintained at 9 oz throughout the study.

Three samples were scorched at each time and temperature increment. The machine produced a 1″ x 4″ scorched area on both sides of the sample which was approx 2″ x 6″ overall with warp running lengthwise. In general, good uniformity of scorching was obtained both between samples and face-to-back of the same sample; but scorching tended to be less uniform at the higher temperatures and longer periods of time. Most fabrics were found to be sensitive to handling—areas with fingerprints tended to scorch heavier.

Scorching in air was accomplished by hanging the samples in a conventional laboratory convection oven so that no part of the fabric surface to be measured was in contact with metal. The variation in temperature of the air surrounding the samples was maintained within limits of ± 5°F.

MEASUREMENT OF SCORCHING ——The term "scorching", when used as a noun in this study, pertains to the change in appearance resulting from the exposure of a fabric to heat, either in air or by contact with a metal surface. The rate and extent of scorching are indicated by changes in reflectance and color.

The instrument used to measure this change was the Color and Color Difference Meter (see Figure 2), manufactured by the Gardner Laboratory, Bethesda, Md, which is equipped to give three values for each sample measured: "R_d" or light reflectance; "a" which measures redness when plus, grey at zero, and greenness when minus; and "b" which measures yellowness when plus, grey at zero, and blueness when minus. Other color-measuring instruments can be used in a similar fashion. These include other tristimulus colorimeters, such as the Hunter Multi-purpose Reflectometer, the PPG-IDL Color Eye, the Colormaster Differential Colorimeter, or any reflectance spectrophotometer (*7, 9*)

Scorching was measured by placing the fabric sample over the plate glass specimen support of the instrument in such a manner that the scorched area completely covered the one-inch-circular light aperture. In all cases the sample, with warp direction always the same, was backed and held flattened against the glass specimen support by the white porcelain enameled standard (NBS 80-42) used to balance the instrument. The readings for R_d, a, and b for each of the three samples tested were recorded and averaged. Three readings were also made and averaged for each of the original, unscorched fabrics.

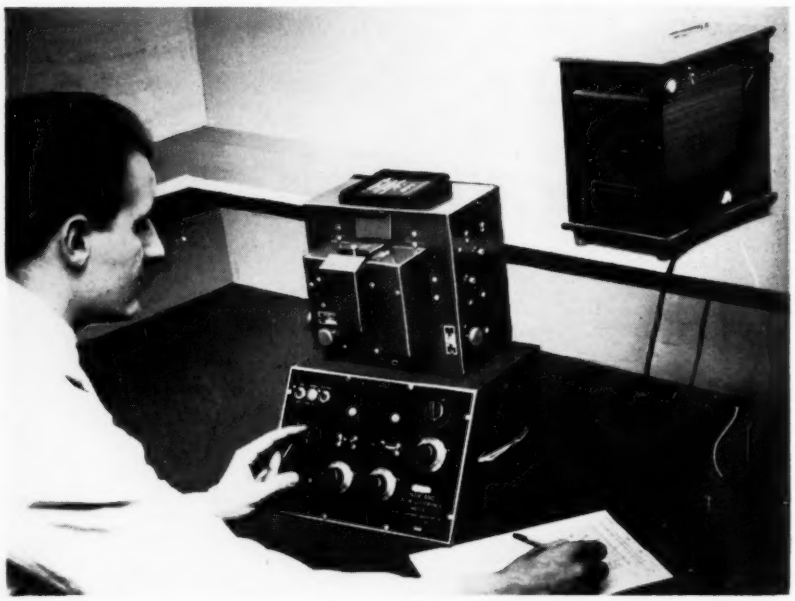


Figure 2
The Color and Color-Difference Meter

CALCULATION OF COLOR DIFFERENCES——The usual means of estimating the extent of scorching for any textile material is to compare the color of the original fabric with that of the scorched area. Various mathematical formulas are available for calculating the numerical values approximating the visual difference in color between two samples as observed by the human eye (*14*). In this study the NBS or Judd unit (Δ E) was used as the measure of color difference and was calculated according to the formula:

$$\Delta E = \sqrt{\overline{\Delta a}^2 + \overline{\Delta b}^2 + \overline{\Delta L}^2}$$

where $L = 10\sqrt{R_d}$

The readings for R_d, a, and b given by the instrument can be considered as the coordinates of a point in the three-dimensional color solid which is roughly in the form of a distorted sphere. The above formula is simply a means of calculating the distance between any two points in the color space, and gives a numerical measure of color difference. A color difference of "one" NBS unit may be described as the difference in color of the average, acceptable commercial color match. The relationship between NBS units and textile terminology ordinarily used in describing color difference has been shown as follows (*20*):

Textile Terms	NBS Units
Trace	0.0– 0.5
Slight	0.5– 1.5
Noticeable	1.5– 3.0
Appreciable	3.0– 6.0
Much	6.0–12.0
Very much	>12.0

All three coordinates (R_d, a, b) are necessary to describe a color fully; but for the color changes encountered in this study, the differences in the "a" readings in every instance were found to be too small to affect materially the values for ΔE. The levels of scorching encountered were adequately covered by changes in b and R_d, yellowness and reflectance, but neither *alone* was sufficient to describe the color change involved. As time or temperature was increased, scorching proceeded from light yellow, through brown and eventually to black. In the earlier stages, the "b" reading is of greatest significance; in the latter stages, R_d assumes much greater importance as can be seen by reference to the figures in Appendix A. Since the "a" readings are of minor importance, a description of the complete range of colors produced by scorching an undyed fabric may be obtained by plotting R_d against "b".

FABRICS——The fabrics used in this study were obtained from various sources—fiber producers, research organizations, and by purchases from stores. None were dyed, most were natural color, a few were bleached. All were apparel-type fabrics in light to medium weights. Appendix B gives a more detailed description of the various fabrics, which are listed briefly as follows: acetate faille, Arnel faille, two different bleached cotton print cloths, the same cotton fabrics partially acetylated (PA Cotton) and partially cyanoethylated (Azoton), sheer Dacron skip-dent dress goods, shirting weight Orlon skip-dent, bleached linen handerchief fabric, nylon taffeta, filament rayon lining material, staple rayon challis, staple rayon challis with Avcoset finish, cotton warp-spun rayon filling 9-oz uniform twill, flat crepe silk, and 6-oz wool serge.

SCOURING PROCEDURE——Since spinning lubricants, sizing materials, or other extraneous matter might affect scorching, all fabrics were given a mild but thorough scouring before testing. About one square yard of each fabric was scoured for 40 minutes at 120-140°F with 1% neutral soap flakes, based on the weight of the goods. This was followed by a thorough rinsing, neutralization in a 1% solution of acetic acid, and further rinsing in distilled water until the fabrics tested to a pH between 6 and 7, The wool fabric, prior to scouring as above, was also given a two-hour Soxhlet extraction with carbon tetrachloride and with isopropyl alcohol to remove oils and waxes. Fabrics were dried at room temperature.

RESULTS AND DISCUSSION

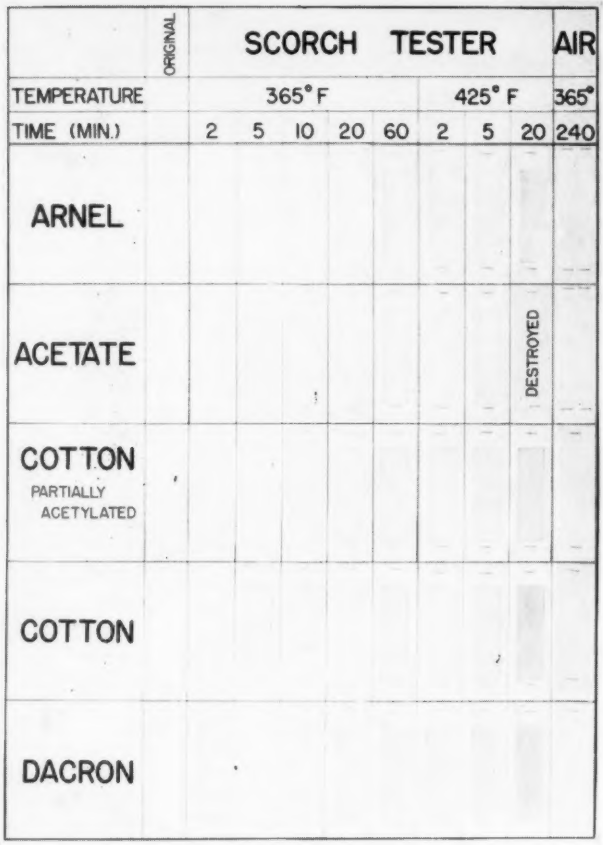
RATE AND EXTENT OF SCORCHING——A series of experiments were conducted to demonstrate the suitability of the scorching and color-measuring technique for determining the scorching characteristics of fabrics. A number of fabrics made from different fibers were heated at a range of temperatures in the Scorch Tester for various periods of time and their color change as compared to the original fabrics, measured. Black-and-white photographs of a number of the scorched samples are shown in Figure 3.

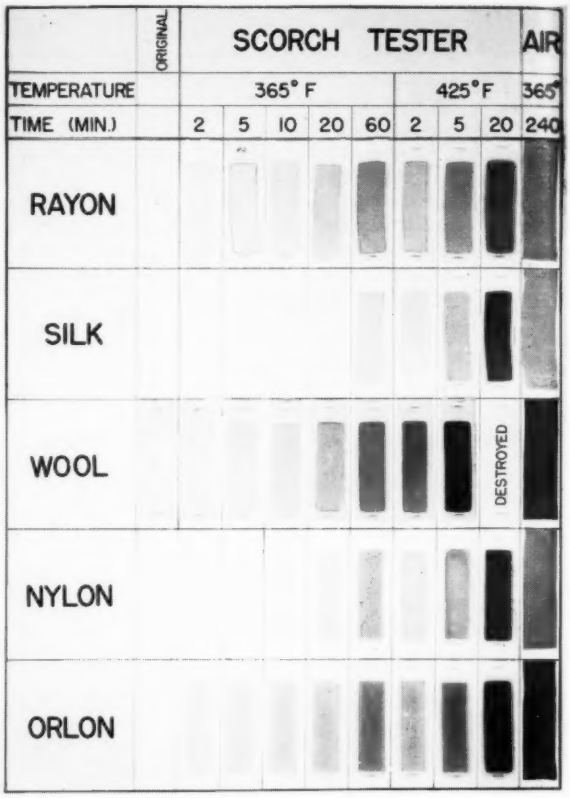
Table I lists the color-difference value (ΔE) obtained from the R_d, a and b readings shown in Appendix A. The temperatures (300°, 365°, 425°, and 500°F) were selected as being representative of the range which fabrics might encounter during service. Table I also shows the lengths of time that the fabrics were subjected to heating at each temperature. In the most complete series at 365°F, these were periods of 2, 5, 10, 20, and 60 minutes. Because of the length of time necessary to produce an appreciable color change for many of the fabrics, the series at 300°F is least complete. At 425° and 500°F samples were run at 2, 5, and 20 minute periods.

TABLE I

Color Difference Values—ΔE

Method of heating	Scorch Tester												Air
Temp (°F)	300		365					425			500			365
Time (min)	2	20	2	5	10	20	60	2	5	20	2	5	20	240
Acetate			1.0	1.6	1.9	2.6	3.8	5.0	7.8					2.7
Arnel			1.1	1.5	1.0	1.5	1.9	1.2	2.3	7.7	16.7	22.8	39.4	2.1
Cotton "A"		3.0	2.2	2.4	5.3	8.2	11.6	8.8	13.4	19.1	21.9	27.9	41.2	12.6
PA cotton		0.9	1.3	2.5	2.8	4.3	6.1	5.1	7.5	11.8	14.8	19.0	29.1	4.6
Cotton "B"				3.9	5.7	8.8	13.6				24.6	28.6	44.1	12.3
Azoton				1.4	3.5	6.0	10.7				25.0	35.9	55.7	11.1
Dacron	0.3	1.2	1.9	3.3	5.0	6.6	10.4	8.0	12.0	16.4				5.7
Linen		1.6	1.7	2.7	4.6	6.6	11.0	6.5	10.4	19.0	21.5	26.5	38.9	13.5
Nylon	0.8	3.2	2.4	8.3	14.1	19.8	28.0	17.5	25.5	39.4				33.7
Orlon	3.2	10.0	11.7	16.2	18.9	21.5	27.0	22.2	31.7	50.3	58.0	70.0	71.9	45.1
Rayon/filament		2.7	3.4	5.9	8.2	12.1	19.3	11.4	16.6	27.2	32.3	39.3	58.8	24.9
Rayon/staple	0.5	2.3	3.7	6.0	9.2	12.5	19.7	14.0	19.4	28.0	33.5	41.4	58.7	23.0
Avcoset			3.1	5.5	8.0	10.8	16.6							
Cotton/rayon			3.0	4.7	6.7	9.3	16.2	10.5	15.4	23.9	28.1	36.1	53.6	19.2
Silk		1.8	1.3	2.7	4.2	7.5	16.7	12.6	22.2	36.8	52.9	64.3	73.0	24.7
Wool		3.9	4.6	6.9	9.5	14.8	23.7	26.0	42.9					31.0





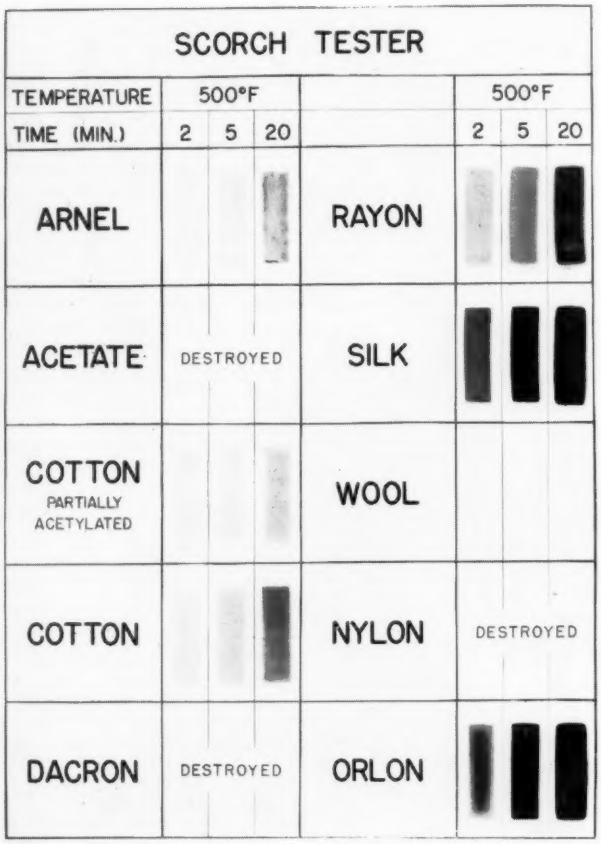


Figure 3
Photographs of scorched samples

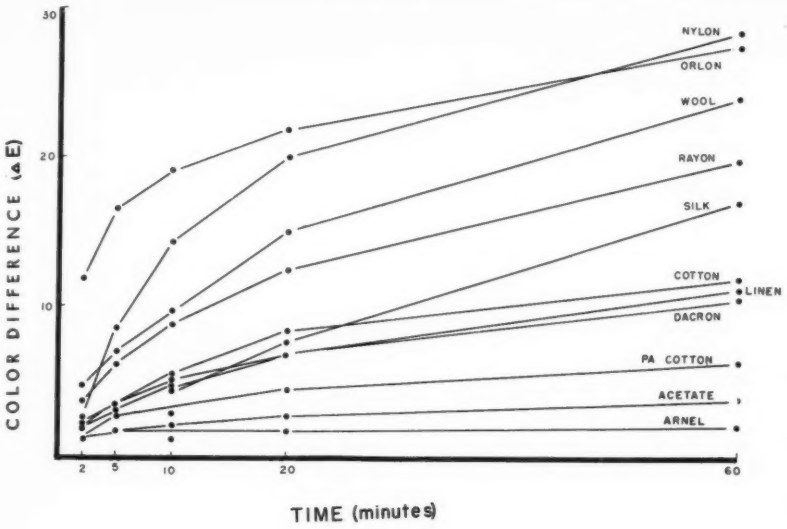


Figure 4
Effect of time on color change at 365°F

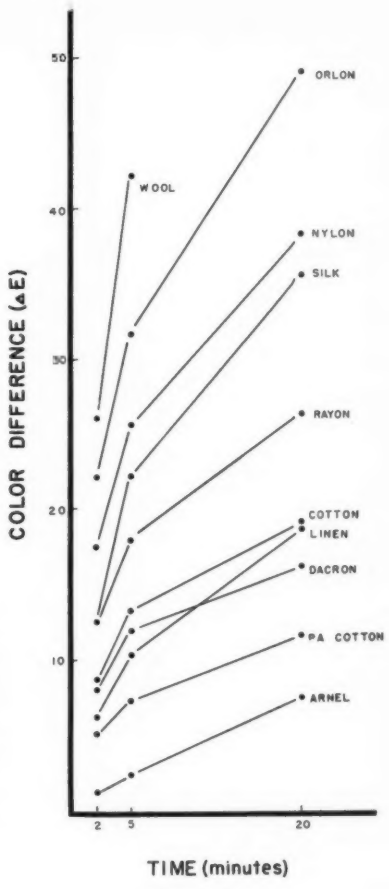


Figure 5
Effect of time on color change at 425°F

No effort was made in this study to measure the temperatures at which glazing, sticking, shrinking, fusing, or melting occurred. However, as any of these effects became apparent during the tests, the fact was noted as shown in Table II. For many of the thermoplastic fabrics, readings were obtained at temperatures obviously higher than their shrinking or fusing points, but they were not dropped from the test until serious damage or actual melting occurred. Only acetate and wool were too seriously affected for testing at the 425°F, 20 min period. Dacron, nylon, and wool could not be tested at the 500°F level. No effort was made to study the strength loss due to heating for any of the fabrics tested.

From the data in Table I, a series of curves were plotted to illustrate the effect of variations in time and temperature on scorching. Figures 4 and 5 show the effects of variations in time of heating at the 365° and 425° levels respectively. In Figure 6, color change is plotted against variations in temperature at the 20 min heating period. Figures 7, 8, 9 and 10 show the effect of changes in

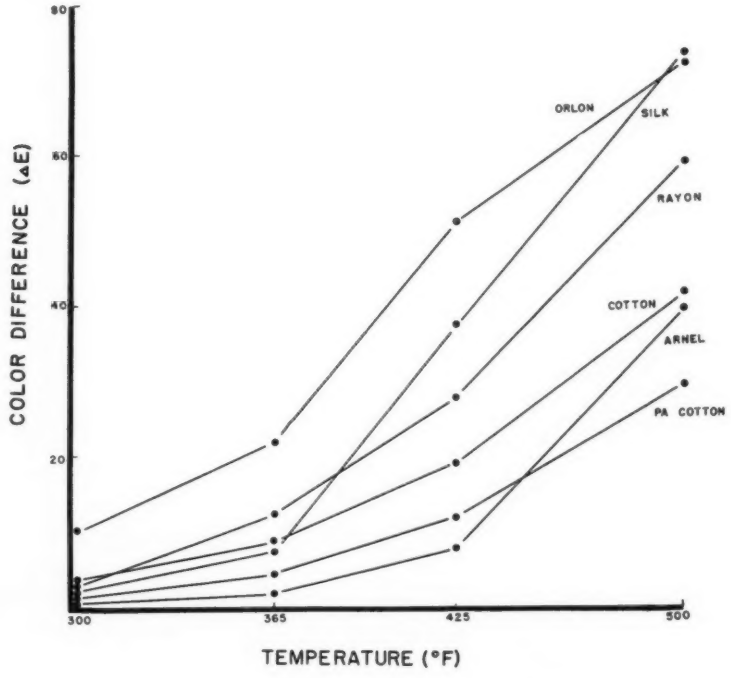


Figure 6
Effect of temperature on color change

TABLE II
Physical Effects of Heating Other Than Scorching

Fiber	Noticeable Effect
Acetate	Slight sticking at 365°F. Fused at 425°F. Not testable at 425° — 20 min.
Arnel	Slight sticking at 425°F. Fused at 500°F.
Dacron	Shrinkage at 365°F. Severe shrinkage at 425°F. Not testable at 500°F.
Nylon	Very slight shrinkage at 365°F. — 60 min. Shrinkage at 425° F. Not testable at 500°F.
Wool	Not testable at 425°F. — 20 min. Badly charred

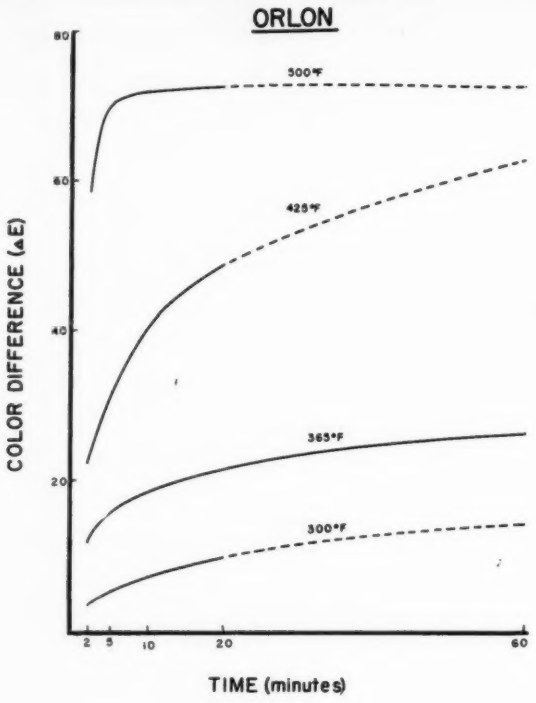


Figure 7

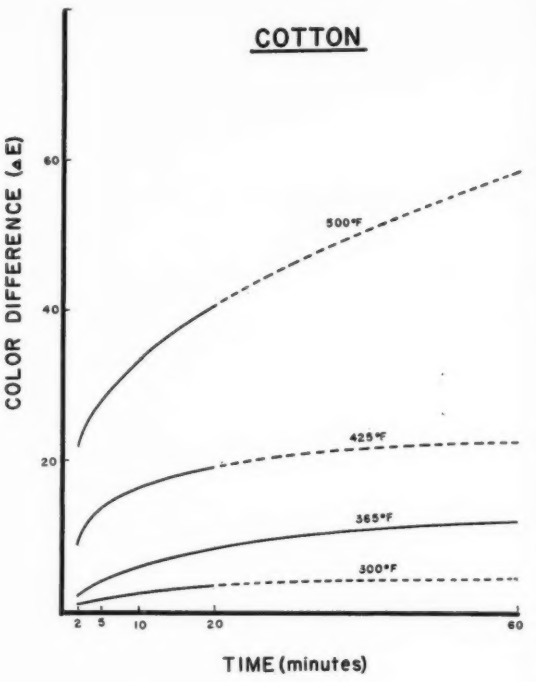


Figure 8

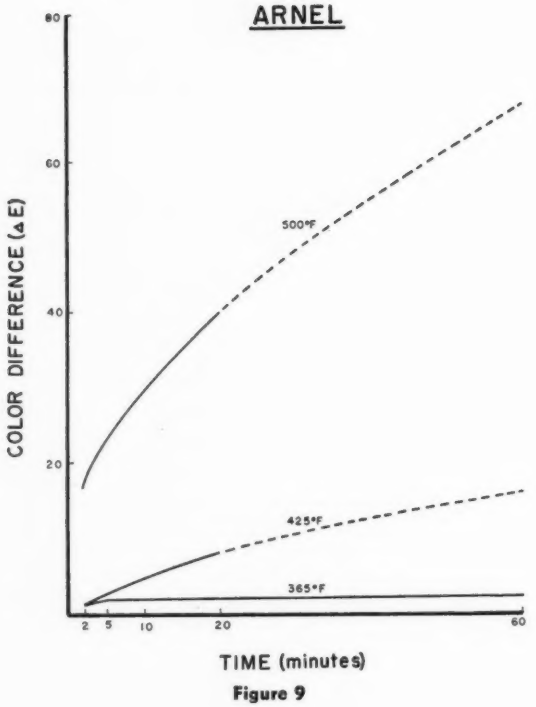


Figure 9

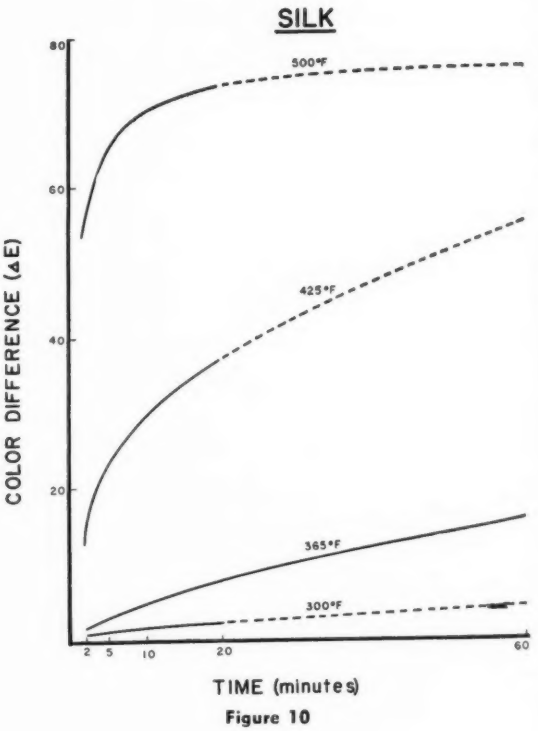


Figure 10

Figures 7-10
Curves showing effect of changes in time and temperature on scorching of four different fabrics

both time and temperature for individual fabrics and may be considered to "characterize" the scorching of that material. The dotted lines are extrapolations and are thus subject to question.

The several curves that can be drawn from the data in Table I provide an overall picture of the scorching characteristics of the various fabrics tested and their relationship to each other that would be difficult to obtain in any other way. Differences and similarities can be clearly seen by comparing the curves for different materials. As might be exepected, scorching is shown to be a function of both time and temperature (*6*). At any given temperature, color change takes place more rapidly at first and then levels off at the longer heating periods. The *rate* of color change increases with temperature for any period of heating.

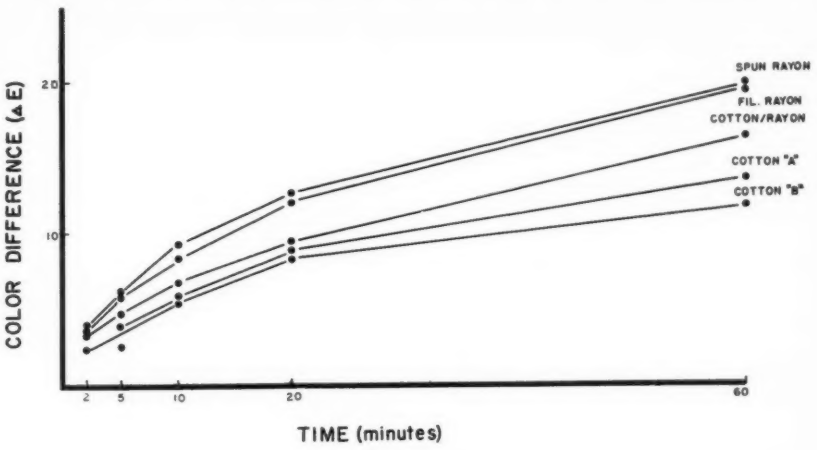


Figure 11
Curves showing the similarity of scorching of different fabrics made from the same fibers

COMPARISON OF FABRICS ——The family of curves obtained by plotting the color changes induced by heating a fabric in contact with a metal surface at a range of temperatures for various periods of time is believed to give a true indication of its scorching characteristics; but it provides a valid means of comparison for only those particular fabrics tested. It is obvious that the original color of the material (whether natural, bleached, or dyed), and its chemical history and finishing treatment will influence the scorching characteristics of the final fabric. Extreme caution must therefore be used in applying such data categorically to the fibers from which the fabrics are made. From the information provided in this study only broad generalizations concerning the scorching characteristics of fibers should be drawn, even though the data were obtained on undyed fabrics freed of extraneous finishing materials.

In Figure 11 are plotted the individual curves for a filament and a staple rayon fabric, for two different cotton fabrics, and for a cotton warp/rayon filling material. Despite the considerable structural differences between the two rayon fabrics, their rates of color change were very similar. The same is true of the two cottons which also differed in fabric structure. It can also be seen that the cotton/rayon fabric falls approximately halfway between the all-cotton and the all-rayon fabrics despite the fact that it was a much heavier material than either. This is interpreted as an indication that the chemical nature of the fiber rather than its form (staple or filament) or fabric structure (thickness or weave) is the determining factor in scorching. The shorter chain length of the cellulose in rayon and its lower crystallinity might account for the difference in scorching between the native and the regenerated cellulose fibers.

From an inspection of the data in Table I and the curves in Figures 4, 5 and 6 it can be seen that the fibers composing the various fabrics tested tend to fall into four general groups which can be arranged according to their molecular structure in the following order of increasing tendency to scorch: 1) acetylated cellulosic fibers, 2) natural cellulosic fibers and polyester fibers, 3) regenerated cellulose fibers and 4) fibers containing nitrogen in the molecule. Partially cyanoethylated cotton, which contains a nitrogen group added to the cellulose molecule is the only exception to the latter. Of the acetylated fibers, the degree of substitution appears to influence the scorching tendency, with Arnel triacetate fiber showing the least color change at all temperatures except 500°F, at which point the fabric had become partly fused. Reference to the curve for Arnel in Figure 6 shows a sharper than usual increase in rate of color change between 425° and 500°F. It is interesting to note that this particular fabric had been previously heat-treated at 420°F. Silk (*17*) appears to react in a manner different from most fibers. From Figures 4, 5, and 6 it can be seen that at lower temperatures and shorter heating periods its color change is less than might be expected from the results at higher temperatures and times.

TABLE III
Comparison of Scorching Scorch Tester versus Oven

Scorching by machine		Scorching in air	
Fabric ranking	365°F −60 min ΔE	Fabric ranking	365°F −240 min ΔE
Arnel	1.9	Arnel	2.1
Acetate	3.8	Acetate	2.7
PA Cotton	6.1	PA Cotton	4.6
Dacron	10.4	Dacron	5.7
Azoton	10.7	Azoton	11.1
Linen	11.0	Cotton	12.5
Cotton	12.6	Linen	13.5
Silk	16.7	Rayon	24.0
Rayon	19.5	Silk	24.7
Wool	23.7	Wool	31.0
Orlon	27.0	Nylon	33.7
Nylon	28.0	Orlon	45.1

Coefficient of Correlation: r = 0.99

SCORCHING IN AIR VS METAL SURFACE——Table III shows the scorching of a series of fabrics heated in air at 365°F in an oven for 4 hours as compared to the same materials heated for one hour at the same temperature against the metal surfaces of the Scorch Tester. It is obvious from the levels of color change obtained, that scorching takes place much faster against the metal surface than in air, a fact observed in earlier work (*15*). This is probably due to the greater rate of energy transfer through metal. However, from the coefficient of correlation of 0.99, it can be seen that the two methods rank the fabrics in the same general order.

EFFECT OF ALKALINITY ON SCORCHING——Alkaline salts are well known to increase the tendency of cellulosic fabrics to discolor when heated. Even the small quantities of sodium bicarbonate found in some

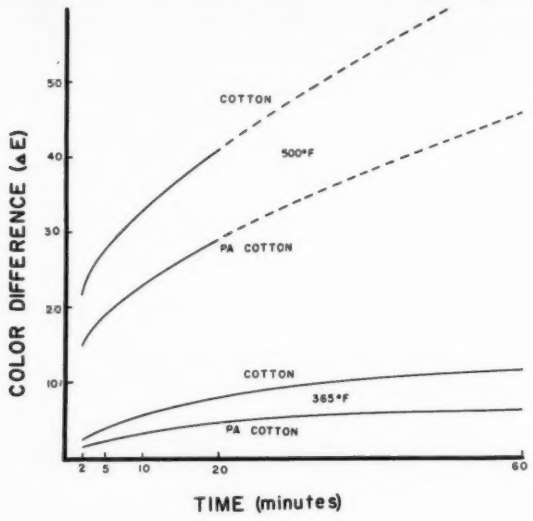


Figure 12
Effect of partial acetylation on the scorching of cotton at two different temperatures

types of softened water may cause yellowing in cotton or rayon garments when exposed to heat (*10*). Because of this, most commercial laundries use a mild sour in the final rinse water (*1*).

In an effort to determine the applicability of this method for detecting this increased tendency to scorch, experiments were run in which samples of staple rayon fabric were immersed in 1/10% solutions of $NaHCO_3$, Na_2CO_3, and a 50-50 mixture of sodium carbonate and bicarbonate. (The latter, known as "modified soda," is frequently used as a water softener and might be found in tap water in certain localities). Another sample was treated in a 1/10% solution of KHF_2 which is frequently used as a commercial laundry sour. The fabrics, after immersion in the salt solutions, were air dried and then heated in the Scorch Tester for 5 min at 365°F and at 425°F.

From the color difference values shown in Table IV it can be seen that the alkaline treated fabrics scorched considerably more than the untreated original. The sample treated with KHF_2 showed no increased scorching. It is interesting to note the small difference between the treatments in carbonate and bicarbonate solutions. The latter could be expected to change to carbonate when heated.

EFFECT OF FINISHING TREATMENTS———Experiments were conducted to show how the method can be used in determining the effect of various chemical treatments on the scorching characteristics of fabrics. A similar method, using a visual comparison of scorching, is described by Noble (*15*) for measuring the effect of additive finishing compounds.

Table V shows the results obtained on fabrics treated with three different chemical finishes—partial acetylation (PA Cotton), partial cyanoethylation (Azoton) and Avcoset finish on spun-rayon. In each case the scorching of the treated material is compared with that of the original, untreated fabric.

In Figure 12 are shown the curves for PA Cotton vs untreated cotton at 365° and 500°F. From these and the data in the table, it can be seen that acetylation significantly improves the resistance of cotton to scorching at all temperatures. These results agree with practical experience with PA Cotton used in ironing board covers.

Cyanoethylation of cotton, although improving strength retention after heating (*3*), is known to have less effect on scorching. At 365°F the Azoton sample was less scorched than the untreated control, but at 500°F the results were reversed. The sample used in this experiment had only 3.7% nitrogen content. It would be interesting to check the results of fabrics having higher degrees of cyanoethylation.

Improved launderability for rayon is claimed for the Avcoset finish, a treatment with hydroxyethyl cellulose and formaldehyde (*22*). Although no other data on scorching is available for comparison, it can be seen from the table that the Avcoset finish tested at 365° showed a small but significantly lower scorching than untreated rayon. This may be due to the lower reactivity of cellulose when cross-linked by formaldehyde.

"BROWN LINE EFFECT"——— The yellowish-brown line which forms at the air-water interface when fibrous materials are partially immersed in water for a period of time is known as the "Brown Line Effect" (*2, 18*). For cellulosic fabrics, at least, the brown line is believed to be caused by the concentration of fiber degradation products accumulating along the line of rapid evaporation. The effect is observed even with thoroughly purified fabrics treated in distilled water, and is thought to be the result of an oxidative degradation of the cellulose. The brown coloring matter is water

TABLE IV
Effect of Alkalies on Scorching

Treatment	Color Difference — ΔE 5 min at 365°F	5 min at 425°F
None	6.2	19.0
0.1% Sodium bicarbonate	15.0	32.7
0.1% Modified soda*	16.7	32.9
0.1% Sodium carbonate	17.9	36.6
0.1% Potassium acid fluoride	5.5	21.7

*50% $NaHCO_3$, 50% Na_2CO_3.

TABLE V
Effect of Finishing Treatments

Method	Temp (°F)	Time (min)	Partial Acetylation ΔE Cotton "A" Original	Partial Acetylation ΔE PA Cotton Treated	Partial Cyanoethylation ΔE Cotton "B" Original	Partial Cyanoethylation ΔE Azoton Treated	Avcoset Finish ΔE Spun Rayon Original	Avcoset Finish ΔE Avcoset Treated
Scorch Tester	300	20	3.0	0.9				
Scorch Tester	365	2	2.2	1.3			3.7	3.1
		5	2.4	2.5	3.9	1.4	6.0	5.5
		10	5.3	2.8	5.7	3.5	9.2	8.0
		20	8.2	4.3	8.8	6.0	12.5	10.8
		60	11.6	6.1	13.6	10.7	19.7	16.6
Oven (air)	365	240	12.6	4.6	12.3	11.1		
Scorch Tester	425	2	8.8	5.1				
		5	13.4	7.5				
		20	19.1	11.8				
Scorch Tester	500	2	21.9	14.8	24.6	25.0		
		5	27.9	19.0	28.6	35.9		
		20	41.2	29.1	44.1	55.7		

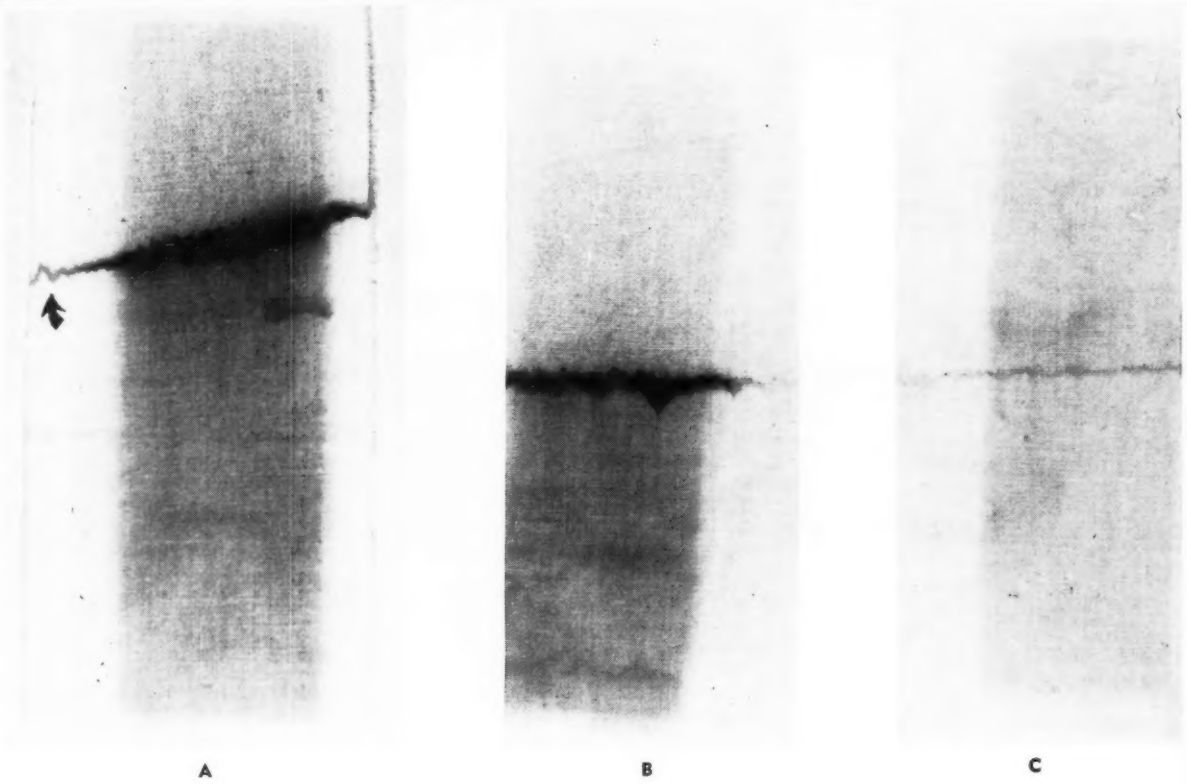


Figure 13

A—Photograph showing increased scorching of brown line. Original, unscorched line may be seen to the left of the scorched area (arrow)

B—Sample with brown line scorched prior to washing in water **C—Sample with brown line scorched after washing in water**

soluble and easily washed out, but after removal a positive test for oxycellulose is obtained along the line of constant evaporation on the fabric. A pronounced brown line is formed during a 24-hour period of evaporation.

From a practical standpoint, the brown line effect may be present to some degree whenever a wet fabric begins to dry out unevenly. In the home it might occur where curtains are wet by rain blown through an open window or when dampened fabrics are left too long before ironing. In a mill or finishing plant a truckload of wet fabric allowed to stand around too long before the next operation, might begin to dry out unevenly on the surface and cause discoloration.

To determine the effect of this phenomenon on scorching, a scoured cotton fabric was partly immersed in distilled water for one week at which time a very heavy brown line had developed. A sample of the fabric with the brown line was then heated between the plates of the Scorch Tester for 2 min at 500°F. The results are shown in the photograph in Figure 13A where it can be seen that the brown line, easily discernable before scorching, was much more heavily scorched after heating than the surrounding fabric and was no longer soluble in water as shown in Figure 13B. In another example the brown line was first removed by washing before heating in the Scorch Tester. The increased scorching at the point where the brown line had formed can be easily seen in the photograph in Figure 13C.

SUGGESTIONS FOR FURTHER WORK———During the course of this study, a number of questions and ideas for new lines of investigation became apparent which the Committee would have pursued, had time permitted. A few of these are briefly outlined below for those who may be sufficiently interested to look into the subject further:

1) What is the relationship between color change and fabric strength?

Although no effort was made to investigate the effects of scorching on strength, it was obvious during the course of the work that as discoloration increased some fabrics lost more strength than others. Earlier work along these lines has been done with cotton (*4*). It would be interesting to extend such a study to other fibers.

The possibilities of using an instrument such as the Scorch Tester to study the heat resistance of fabrics and finishes should be investigated as an alternative to the conventional, time consuming method of heating in air in an oven for many hours. The 1″ x 4″ samples produced by the

machine are well suited to breaking strength measurements.

2) *What are the scorching characteristics of degraded cellulose?*

Do hydro- and oxycellulose scorch differently than the undamaged fiber? Are overbleached cotton fabrics and garments, after repeated launderings, more sensitive to scorching?

3) *What effect does the presence of small amounts of acid or alkaline salts have on the scorching characteristics of the noncellulosic fibers?*

A study of the effects on scorching of small quantities of the various chemicals that might be encountered by a garment during service or maintenance would be of interest to housewives, laundries, and drycleaners.

4) *What is the effect of fabric color on scorching?*

The depth and hue of a dyed fabric affect the visibility of scorching. By use of the techniques described in this study it should be possible to determine the best dyes and range of colors to use with materials which are susceptible to scorching during service.

5) The fact that variations in fabric moisture or increased pressure on the upper plate of the Scorch Tester had little effect on scorching should be investigated further since it is known that these factors are of importance to home ironing or commercial pressing operations. This may be due to the fact that in the Scorch Tester equal heat is applied to both sides of the fabric simultaneously while in the ordinary ironing operation a fabric padding is usually present on one side. A further study of these factors should be made.

6) *What are the cumulative effects of scorching?*

A preliminary series of experiments indicated that scorching is cumulative. The color change of cotton and nylon fabrics heated for two 5-min periods at 365°F (with time to cool and recondition between heatings) was very similar to that produced by one 10-min heating period. It would be interesting to study the cumulative effects of a larger number of smaller increments of heating.

White or light colored fabrics gradually yellow over long periods of use. The cumulative effects of scorching from repeated hot-air drying, pressing or ironing may well be one of the factors causing discoloration. For cellulosic fabrics at least, the build-up of yellowness from scorching or soiling is commonly controlled by a mild bleach during laundering; but for fabrics that are drycleaned only or that cannot be bleached, the gradual discoloration with age may become a more serious problem. The methods outlined in this work offer a means of studying the importance of this factor of fabric aging.

SUMMARY AND CONCLUSIONS

1) Scorching, the change in color and texture produced by heating a fabric, is a fundamental fiber characteristic of considerable importance to textile manufacturers and finishers, to laundries and drycleaners, and to consumers. Despite its importance, little quantitative data are available, particularly for the newer synthetic fibers, and methods for studying and measuring scorching are lacking.

2) The Scorch Tester was used to develop a technique for studying the scorching characteristics of fabrics heated in contact with metal surfaces. Changes in reflectance and hue caused by heating were measured with the usual photoelectric optical devices. The Judd - Hunter - Scofield equation was used to calculate the difference in color between the original and the scorched sample. The NBS Unit of Color Difference was found to be a useful tool for describing the extent of the color change produced by heating a fabric.

3) The color changes of fabrics made from a number of different fibers heated at various temperatures and periods of time were measured. The family of curves plotted from such data was found to be a reliable and convenient means of evaluating and comparing the scorching characteristics of fabrics and finishing treatments.

4) The results of a series of experiments used in developing the techniques were presented as a means of demonstrating the application of the method to the study of scorching. The results of these experiments indicate that:
   a) Measurement of both yellowness and reflectance are necessary to describe fully the changes in appearance due to scorching.
   b) Scorching is a function of both time and temperature. At any temperature, color change takes place most rapidly during the initial stages of heating; and for any period of time, the rate of scorching increases with temperature.
   c) Fabrics scorch faster in contact with a heated metal surface than in air, but both methods rank fabrics in the same general order.
   d) Scorching is more dependent on the chemical nature of the fiber or finishing treatment than on the physical form of the fiber or fabric. For the particular fibers studied, the tendency to scorch increased in the following order: acetylated cellulose fibers, native cellulose and polyester fibers, regenerated cellulose fibers, and fibers containing nitrogen in the molecule.
   e) Low concentrations of weak alkalies increase the scorching of cellulosic fabrics.
   f) Partial acetylation of cotton significantly increases its resistance to scorching.
   g) The scorching of a cellulosic fabric is increased by prolonged evaporation of water at localized areas.

5) A number of suggestions for further work which arose during the course of this study were listed. These, together with the principles and techniques described in the paper, provide a basis for further advances in the study of the effects of heat on textile materials.

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APPENDIX A

Reflectance and Color Values Used in Calculating Color Difference

Method		Original	Scorch Tester												Air
Temp °F			300		365					425			500			365
Time (min)			2	20	2	5	10	20	60	2	5	20	2	5	20	240
Acetate	R_d	83.7	—	—	85.4	85.8	85.7	84.3	84.2	78.5	77.0	—	—	—	—	84.9
	a	−0.5	—	—	−0.6	−0.7	−0.7	−0.8	−1.0	−1.1	−1.4	—	—	—	—	−1.0
	b	+1.7	—	—	+2.3	+2.8	+3.2	+4.3	+5.5	+5.7	+8.4	—	—	—	—	+4.3
Arnel	R_d	91.2	—	—	89.3	88.6	89.4	88.6	89.2	89.5	89.1	84.6	73.0	64.7	38.9	89.3
	a	−0.4	—	—	−0.5	−0.5	−0.5	−0.4	−0.6	−0.6	−0.7	−1.0	−0.2	+0.6	+3.9	−0.7
	b	+1.3	—	—	+1.3	+1.5	+1.6	+1.9	+2.8	+2.1	+3.3	+8.1	+14.5	+18.3	+22.2	+3.1
Cotton "A"	R_d	79.1	—	77.9	78.5	77.6	75.2	72.5	70.2	71.9	66.5	58.0	53.4	44.3	27.0	72.1
	a	−0.6	—	−1.1	−0.9	−0.9	−1.0	−0.9	−1.0	−1.0	−0.4	+0.6	+1.6	+2.7	+3.9	−1.4
	b	+1.2	—	+4.0	+3.3	+3.5	+6.0	+8.5	+11.6	+9.0	+12.4	+16.5	+16.1	+17.7	+18.9	+12.8
PA Cotton	R_d	78.6	—	78.5	78.0	76.9	77.1	75.7	74.2	73.8	71.1	66.1	59.6	54.3	39.6	76.5
	a	−0.9	—	−1.1	−1.1	−1.2	−1.2	−1.3	−1.2	−0.9	−0.7	−0.2	+0.7	+1.5	+2.6	−1.3
	b	+3.5	—	+4.4	+4.7	+5.7	+6.1	+7.4	+9.0	+7.8	+9.6	+12.7	+12.8	+14.8	+16.5	+8.3
Cotton "B"	R_d	81.9	—	—	—	80.3	79.3	76.3	71.9	—	—	—	49.9	44.7	25.2	73.8
	a	−0.5	—	—	—	−1.0	−1.2	−1.2	−0.9	—	—	—	+1.8	+2.5	+3.3	−1.4
	b	+0.8	—	—	—	+4.6	+6.3	+8.9	+13.1	—	—	—	+15.1	+16.7	+18.4	+12.2
Azoton	R_d	80.4	—	—	—	80.7	79.1	77.3	72.3	—	—	—	46.4	31.6	12.7	71.2
	a	−0.6	—	—	—	−0.7	−1.0	−1.1	−0.8	—	—	—	+2.0	+2.0	+2.6	−1.1
	b	+2.2	—	—	—	+3.6	+5.6	+7.9	+11.8	—	—	—	+14.4	+14.7	+14.9	+12.0
Dacron	R_d	76.2	76.7	76.1	75.5	74.0	72.7	71.7	68.9	70.1	65.8	60.9	—	—	—	74.1
	a	−0.6	−0.6	−0.8	−0.7	−0.9	−1.1	−1.1	−1.1	−1.0	−0.7	−0.2	—	—	—	−1.5
	b	+0.0	+0.3	+1.2	+1.8	+3.1	+4.6	+6.1	+9.4	+7.1	+10.1	+13.5	—	—	—	+5.5
Linen	R_d	79.7	—	79.9	79.7	79.4	78.4	77.0	72.7	77.6	74.7	64.5	59.6	51.4	32.0	72.2
	a	−0.2	—	−0.5	−0.6	−0.7	−0.9	−1.1	−1.0	−1.0	−1.1	−0.1	+0.5	+2.0	+4.3	−1.5
	b	−0.5	—	+1.1	+1.1	+2.1	+4.0	+5.9	+9.7	+5.8	+9.4	+16.3	+17.3	+19.3	+20.3	+12.3
Nylon	R_d	85.3	85.0	83.7	84.0	81.2	77.1	71.9	59.7	72.4	61.5	37.6	—	—	—	49.7
	a	−0.4	−0.7	−1.2	−1.1	−2.0	−2.4	−1.7	+0.7	−1.8	+0.1	+5.3	—	—	—	+1.2
	b	+0.6	+1.3	+3.5	+2.8	+8.4	+13.9	+18.8	+24.1	+16.5	+21.9	+24.1	—	—	—	+26.1
Orlon	R_d	79.5	78.3	73.9	71.6	66.6	63.0	61.4	55.0	59.5	48.9	23.1	13.6	3.8	3.0	30.5
	a	−0.8	−1.2	−1.6	−1.5	−0.8	−0.5	−0.3	+0.4	−0.1	+1.6	+10.6	+12.1	+3.8	−2.5	+9.1
	b	+1.1	+4.2	+10.5	+11.8	+15.0	+17.3	+19.7	+23.5	+19.7	+26.2	+27.8	+22.6	+5.6	+1.2	+29.0
Rayon filament	R_d	81.4	—	80.3	79.6	78.4	76.2	72.8	62.4	74.3	68.6	52.6	43.7	33.6	12.3	57.1
	a	−0.6	—	−1.0	−1.0	−1.2	−1.4	−1.3	+0.1	−1.4	−0.5	+2.0	+3.2	+4.8	+7.2	+0.4
	b	+1.2	—	+3.8	+4.4	+6.8	+8.9	+12.2	+16.9	+11.8	+16.1	+21.7	+22.4	+23.1	+20.1	+21.3
Rayon staple	R_d	78.6	79.1	78.4	77.4	75.3	73.9	70.9	58.2	69.2	61.2	45.6	37.5	27.3	10.6	56.4
	a	−1.1	−1.2	−1.4	−1.4	−1.7	−1.9	−1.6	+1.0	−1.3	−0.1	+3.4	+4.2	+4.9	+6.4	+1.2
	b	+3.2	+3.7	+5.5	+6.8	+8.9	+12.0	+14.9	+18.5	+16.1	+19.5	+22.1	+21.8	+21.9	+19.2	+21.6
Avcoset	R_d	77.6	—	—	75.2	74.3	72.2	70.1	64.2	—	—	—	—	—	—	—
	a	−1.0	—	—	−1.3	−1.6	−1.7	−1.6	−0.7	—	—	—	—	—	—	—
	b	+3.2	—	—	+5.9	+8.3	+10.6	+13.1	+17.7	—	—	—	—	—	—	—
Cotton/ Rayon	R_d	79.1	—	—	76.2	73.4	72.0	68.5	56.7	66.7	58.8	46.2	39.9	30.4	13.6	59.4
	a	−0.6	—	—	−0.6	−0.3	+0.0	+0.4	+1.6	+0.4	+1.4	+2.5	+2.4	+3.0	+4.9	+2.0
	b	+6.8	—	—	+9.3	+10.9	+12.1	+13.7	+15.3	+14.4	+16.0	+17.9	+17.6	+18.9	+18.6	+18.4
Silk	R_d	78.6	—	78.7	79.2	78.9	78.8	78.2	73.6	75.2	69.0	42.2	16.8	7.0	2.5	64.4
	a	−0.6	—	−1.1	−1.0	−1.4	−1.7	−2.4	−3.3	−3.1	−2.4	+5.1	+7.2	+6.3	+3.1	−1.9
	b	+0.9	—	+2.6	+2.1	+3.5	+4.9	+8.2	+17.1	+13.1	+22.3	+28.6	+22.7	+15.9	+5.4	+24.3
Wool	R_d	66.4	—	66.4	64.8	64.0	62.3	56.8	45.9	40.6	18.0	—	—	—	—	34.2
	a	−2.4	—	−2.5	−3.2	−3.3	−2.8	−1.4	+4.0	+5.8	+10.1	—	—	—	—	+7.9
	b	+12.3	—	+16.2	16.7	+19.0	+21.4	+25.7	+30.5	+29.3	+24.8	—	—	—	—	+30.3

NOTE: Each reading is an average of three samples.
R_d = % Reflectance
a = Red when positive, green when negative
b = Yellow when positive, blue when negative

APPENDIX B

Detail of Fabrics Used

Fabric	Fabric type	Fiber type	Filament or Staple	Fabric construction	Finish
Acetate	faille taffeta	cellulose acetate	F	plain weave 200×52 75/200 bright warp 300/80 bright filling	none
Arnel	faille taffeta	cellulose triacetate	F	plain weave 93×59 75/20 warp 150/40 filling	heat treated at 420°F
Cotton "A"	print cloth	native cellulose	S	plain weave 68×72 4.75 yds/lb 39″	kiered and bleached
PA Cotton	print cloth	native cellulose—partially acetylated	S	plain weave 68×72 4.75 yds/lb 39″	kiered, bleached and partially acetylated in the piece. 20.2% acetyl content
Cotton "B"	special print cloth	native cellulose	S	plain weave 78×82 70's/2 combed warp and filling	kiered and bleached yarn
Azoton	special print cloth	native cellulose—partially cyanoethylated	S	plain weave 78×79 68's/2 combed warp and filling	kiered and bleached cyanoethylated yarn 3.7 nitrogen
Dacron	sheer dress goods	polyester fiber	F	skip-dent 168×128	none?
Linen	handkerchief fabric	native cellulose	S	plain weave 80×78	bleached
Nylon	taffeta	polyamide fiber	F	plain weave 160×88	none?
Orlon	lightweight shirting	polyacrylic fiber	F	skip-dent 82×70	none?
Rayon/ filament	lining fabric	regenerated cellulose	F	plain weave 112×68 150/40 bright warp and filling	none
Rayon/ staple	challis	regenerated cellulose	S	plain weave 56×44 20's/1 warp & filling	none
Avcoset	challis	regenerated cellulose—modified	S	plain weave 56×44 20's warp & filling	hydroxyethyl cellulose ether and formaldehyde
Cotton/ rayon	twill uniform fabric	mixed native & regenerated cellulose	S	2/1 double twill 60×54 60's/2 combed merc cotton warp 24's/2 1.5 den 1-9/16″ bright spun rayon fill 9 oz/sq yd	scoured
Silk	flat crepe	protein fiber	F	plain weave 152×116	scoured
Wool	wool serge	protein fiber	S	twill weave 53×44 worsted warp woolen filling 6 oz/sq yd	none

AATCC Calendar

COUNCIL
Jan 18 (Hotel Statler, New York); Mar 29 (Roanoke, Va); June 7 (New York)

NATIONAL CONVENTIONS
Nov 14-16, 1957 (Hotel Statler, Boston); 1958 (Hotel Conrad Hilton, Chicago); 1959 (Sheraton Park and Shoreham Hotels, Washington, D C); 1960 (Philadelphia, Pa); 1961 (Buffalo, NY)

MID-WEST SECTION
February 16 (Hotel Bismarck, Chicago, Ill)

NEW YORK SECTION
Jan 23, Mar 1 (Hotel Delmonico, New York, NY); Apr 26, May 24—ladies nite (Kohler's Swiss Chalet, Rochelle Park, NJ); June (Annual Outing)

NIAGARA FRONTIER SECTION
Dec 7, Jan 11, Mar 15 (Buffalo, NY); Apr 5 (joint meeting with CATCC at Kitchener, Ont)

NORTHERN NEW ENGLAND SECTION
Dec 1 (Annual Meeting—Hotel Vendome, Boston)

PHILADELPHIA SECTION
Dec 7 (Kugler's Restaurant, Philadelphia, Pa)

RHODE ISLAND SECTION
Dec 6 (Annual Meeting, Johnson's Hummocks Grille, Providence, RI)

SOUTH CENTRAL SECTION
Dec 1 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION
Dec 8 (Atlanta, Ga)

OBITUARY

HUGH CHRISTISON

Hugh Christison, charter member and former national vice-president of the American Association of Textile Chemists and Colorists, died November 5 at his home, 112 Pleasant Street, Methuen, Mass. He was 72.

He had been chief chemist at Arlington Mills, Lawrence, Mass, from which post he had been retired five years.

Mr Christison was an honorary member of AATCC, and was vice-president from 1944-46. He also had been a national councilor of the Association, had served on many AATCC research committees, and was a member of the Northern New England Section.

He is survived by his widow, Grace L; three sons: Hugh L, of New York, John, of Chattanooga, and David, of Woodbury, NJ.

Mr Christison was also a member of the American Chemical Society and the Chemists Club of New York.

Funeral was held November 7 from the Edward Douglas Memorial Home, 251 Broadway, Methuen, Mass, and burial was at Elmwood Cemetery, Methuen.

The family requested that no flowers be sent, but that contributions be made to the Memorial Fund of Lawrence General Hospital, Lawrence, Mass.

Membership Applications

SENIOR

Philip T Bodell — Research engineer, Collins & Aikman Corp, Bristol, RI. Sponsors: W D Rochon, F J Lynch

Joseph A Boublis—Head finisher, Fair Lawn Finishing Co, Fair Lawn, NJ. Sponsors: W G Helmus, H Moore

Joseph V Brunetta—Lab supervisor, Fair Lawn Finishing Co, Fair Lawn, NJ. Sponsors: W G Helmus, H Moore

Eugene Burke — Lab technician, Eureka Printing Co, Clifton, NJ. Sponsors: J B Young, M J Babey

Richard D Cirillo—Dyer, Fair Lawn Finishing Co, Fair Lawn, NJ. Sponsors: A G Helmus, H Moore

Raymond L Clapp — Salesman-demonstrator, laboratory technician, Marlowe-Van Loan Corp, High Point, NC. Sponsors: T A Marlowe, J W Van Loan

James V DeMick—Colorist, General Text Processors (American Div), Paterson, NJ. Sponsors: P J Luck, P W Pursell

Alfred Desmarais—Chemist, USF-Aspinook Corp, Div of Gera Corp, Jewett City, Conn. Sponsors: M J Quigley, E W Counsell

William Dimond—Superintendent, Empire Pc Dyeing & Finish Co, Paterson, NJ. Sponsors: R A Scher, J A Snyder

James H Duffy — Head, Quality Control Dept, Iselin-Jefferson Co, Inc, New York, NY. Sponsors: H A Weil, R P Nirenberg

Frank C Fatora—Textile resin develop chemist, American Cyanamid Co, Bound Brook, NJ. Sponsors: R Polansky, R D Vartanian

(Concluded on page P861)

Perkin Centennial———

PROCEEDINGS OF THE 1956 OLNEY AWARD LUNCHEON*

INTRODUCTORY REMARKS

HENRY F HERRMANN
Vat Dye Institute

DR HAMBURGER, past Medalists, Mr President and officers of the ATTCC, ladies and gentlemen: My friends, it is an honor to function on this occasion, which I much appreciate, since the mere participation in the presentation of the Olney Medal, which is the highest honor which our Association can bestow, is a thrill.

The Medal has been endowed by the Howes Publishing Co, Inc, to be awarded annually, or at such intervals as the Committee of Award may elect, to a citizen of the United States for outstanding achievement in the field of textile chemistry and as a testimonial to our founder, Dr Louis Atwell Olney, in recognition of his lifetime of devotion and multitudinous contributions to this field. He was the first recipient of this medal, and its presentation to him was indeed a reciprocal honor which has added an extra luster to it.

I will now call the roll of past medalists, most of whom are sitting at the head table.

1944 Louis A Olney
1945 Milton Harris
1946 William H Cady
1947 Edward R Schwarz
1948 Harold M Chase
1949 Charles A Seibert
1950 George L Royer
1951 Raymond W Jacoby
1952 Werner von Bergen
1953 Roland E Derby
1954 William D Appel
1955 Miles A Dahlen

I am inclined to question the appellation of "winner" to our list of distinguished medalists, since the term inevitably brings to mind "loser", of whom there have been none. Every aspirant to the Medal is in the race and the selection committee is only too happy to acknowledge the year's leader without any prejudice to those on his trail.

The interpretation of the basis for awarding the Olney Medal has caused quite a little discussion at times, and I remember one such occasion while I was president and had the privilege of presenting the medal three times. In certain quarters there was a feeling that the Medal might be used to encourage research as well as to reward it. There was a prominent industrialist in the South—possibly two—who had fostered research in textile chemistry by founding laboratories, endowing scholarships and in many ways supporting research and honoring research workers. In my perplexity I turned to Fritz Howes as founder of the Medal and asked him for a ruling on the point at issue. His reply was prompt and forthright: The Olney medal is meant to reward personal accomplishment in research—to acknowledge the toil of the brains and the hands of individuals who have achieved noteworthy contributions to the science and art of dye application and other phases of textile chemistry. It is not meant to gild industrial success, which carries its own reward, or to be a vehicle for kudos in recognition of commercial support given to research, since this, in the last analysis, brings its own reward. The Olney Medal is intended to single out from among our ranks workers in research who have contributed more to the sciences in which we are interested than an immediate reward in worldly goods might reflect. It is to reward toil and talent and not to augment the customary rewards of industrial success.

True to the wishes of Fritz Howes, the Medal has been given to men who toil beyond the call of duty in their chosen profession, to permit us—on the sidelines—to assure them that their efforts are not unnoticed.

In 1947, Walter J Hamburger, today's Medalist, addressed us on Edward Robinson Schwarz, the Medalist of that year, on "The Medalist, The Man." By a unique reversal of events, Prof Schwarz will tell us what he thinks of Walter Hamburger on the general theme "The Medalist." I am sure that pleasant recollections will lend an additional glow to the professor's eloquence.

Prof Schwarz needs no introduction—medalist, scientist and educator—he is a son of AATCC of whom we are very proud. His general theme, besides Walter J Hamburger, is the "Power of Purpose."

POWER OF PURPOSE

EDWARD R SCHWARZ
Massachusetts Institute of Technology

THIS is the occasion for our honoring three people—to each of whom the textile industry owes a debt of gratitude. Each of these men has a background of scientific achievement worthy of remembrance and of public recognition.

Perkin has a memorial rainbow of gorgeous colors symbolic of his work in aniline dyestuffs.

Olney has a monument in this very organization, met here today—the American Association of Textile Chemists and Colorists.

Walter Julian Hamburger — the medalist—has to his credit an organization of a somewhat different kind—Fabric Research Laboratories.

Perkin is being honored by the events of this centennial week. Olney is remembered today through the presentation of the medal bearing his name and likeness. Hamburger is being honored today as the recipient of that medal—and, in the honoring, could be made to listen to a listing of the many notable contributions to textile technology made by him over the past quarter of a century.

I shall not attempt such a listing. I should almost certainly err by reason of omission and could only plead in extenuation, the prerogative of the professor to be absent-minded. There is also, of course, the biographical or the statistical approach. This I shall not avoid entirely, but if statistics are to be used here I would rather they were of the sort related to matters of quality—the quality of purpose. I could detail something of the personal association with the medalist which I have enjoyed, dating from undergraduate days shared at the Massachusetts Institute of Technology, in what are now known popularly as the "roaring twenties"; when Walter's claim to fame was thespian rather than scientific. In those days the Tech Show was a production indeed—and Walter was a part of it, and a leading part—as a raving blonde.

I never got away from Tech, but your medalist did, for a while. Somehow, somewhere, in those years was born an abiding dream; and this is to be my theme in what follows, for

* Held in the Grand Ballroom of the Waldorf Astoria, New York, N Y, on September 13, 1956 during the Perkin Centennial

in each of the three men we honor today, there was the drive toward a goal because of the power of a purpose.

About three-quarters of a century ago, textile technology was born in this country, and was fostered in its youth by the engineer. There were interesting stages in the development from infancy through adolescence, each overlapping each. Textile mill construction paved the way for industrial plants in other fields as well. Textile machine construction progressed from the work of individual craftsmen to large-scale building of interchangeable parts. Power changed from direct water wheel, through steam engine, to electrical energy—and so we came to the 1920's.

The demands of a world war brought home to the textile industry the necessity for testing their products in accordance with specifications. Committee D-13 on textiles of the American Society for Testing Materials became an increasingly large and important group in this connection and your medalist continues a long and respected association with them.

Testing machines of many sorts were designed and built—and, inevitably, as tests became more versatile and more precise—variables, hitherto obscured, were recognized and the scientist increasingly brought about a change in emphasis from *testing* to *research*—from "What?" to "How?" and "Why?".

The Textile Institute came into being in Great Britain, and your medalist is one of the early fellows of the Textile Institute in this country; has been an honored lecturer by invitation before this organization in their home territory, and is currently a member of their American Panel. The American Association of Textile Chemists and Colorists and the United States Institute for Textile Research (now the Textile Research Institute) were early on the scene.

The AATCC, through the inspiration of Dr Olney, pioneered in research allied with the end-use of textiles and with chemical processing, particularly with dyeing and finishing. Their work has been of great importance in matters relating (among many) to water resistance, resin treatment, flammability, washability, and fastness to light. As a result, a number of test devices have been designed, built and put to use; and details of technique have been worked out.

Dr E R Schwarz delivering his address, "Power of Purpose"

The Textile Research Institute has planned and continues to conduct fundamental research on fiber structure, visco-elastic behavior of textiles, and the like and to investigate the impact of modern techniques in physics, chemistry, chemical engineering, and mathematics on textile technology.

The Fiber Society provides an uninhibited meeting ground—or should I say "arena"—for the spirited interchange of ideas in the field of textile research.

The American Association for Textile Technology affords regular and frequent opportunity for presentation of matters of current interest in textile technology and manufacturing.

In all of these and more, your medalist has had a hand and a voice, and in all of them his influence has been felt.

But back to "This is your Life". Eventually—after the end of his undergraduate days at MIT and a time in general engineering—through a chain of circumstance which were quite unplanned, Walter found himself associated with the H Schindler Company, in an executive capacity. Their products included tennis racquet strings made of textile filaments instead of the conventional gut. Here was a challenge calling for the carry-over into the string in the racquet, of the desired fiber properties. This entailed a detailed knowledge of the geometry of the structures involved and the properties of the materials. So back to Tech for a Master of Science Degree in Textile Technology the hard way, after years of absence from the academic halls. If these halls had ever existed in an Ivory Tower, this ceased with his return. Only one other student in my experience has even approached him in ability to seek out basic principles and to ask so many and so searching questions! In textile microscopy, for example, it is certainly true that the instructor learned more about polarized light and its behavior in demonstrating the molecular architecture of fibers, while trying to answer the penetrating questions Walter shot at him at every session, than did the class.

I suspect that it was about this time that textile manufacturer, Hamburger, began to develop a mental itch—only a little later to become a fixed purpose to do something in the field of textile research. There were a number of excellent testing laboratories commercially available to the industry. They received materials from their customers, tested them for this and that, and reported the results. Their principle product was data—increasingly good data, carefully obtained and well presented.

But your medalist was possessed with the idea that there was a real and important need for an organization to make commercially available the interpretation of research results. Such a laboratory would plan and conduct sponsored research in a business-like way and would work with the sponsor in matters of interpretation and application—adding, as opportunity afforded, findings of its own research program, which would build up a back-log of basic information.

So textile manufacturer Hamburger became research director Hamburger and in initially modest quarters in Copley Square, Boston, Fabric Research Laboratories came into being as a full-time venture. Venture it was—and adventure as well! There were many headaches—literally and figuratively—including the earning of a Doctor of Philosophy degree from Brooklyn Polytechnic Institute—again the hard way, by commuting between Boston and New York. And here a devoted but long-suffering wife in no small measure over many months earned a share in this medal. But there were triumphs as well, and the organization grew to occupy the entire building and began to burst at the seams—as many a textile has before it. Then came the new building in Dedham and the power of an abiding purpose was evident.

He who achieves much must dare much.

Dr Hamburger dared greatly, dreamed well and worked hard and in it all remained a talented and genial classmate, an outstanding student, an able colleague, a world-recognized scientist, a warm and well-loved personal friend—and today is your Olney Medalist for 1956.

The Olney Medal

PRESENTATION OF THE OLNEY MEDAL TO WALTER JULIAN HAMBURGER

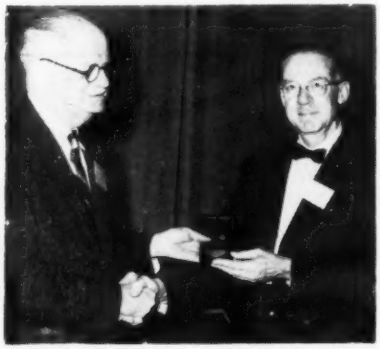
RAYMOND W JACOBY
President, AATCC

WALTER JULIAN HAMBURGER: since the AATCC was founded, the textile industry and those connected with it have undergone a most radical change in thought and action. No longer is there a sharp cleavage between textile technology and textile Chemistry. New fibers, new fabrics, new finishes, new chemicals, new processes and new equipment have brought these two areas together, so that now they are intimately connected and intertwined.

In spite of these changes, our industry has made remarkable progress. This is due largely to the fact that there are within its ranks men of ability, men of knowledge and men of vision who have realized the interconnection of these spheres of thought and have guided their learning and activities accordingly. No longer can either the technology or the chemistry of textiles be considered a separate entity. Men of vision have learned that every problem they encounter must be considered from both angles. They appreciate that stress—strain curves, or X-rays showing the amorphous or crystalline structure of fibers, can be of as much help in solving problems as charts showing the effect of pH on the rate of exhaustion of dyes, or chemical titration, chemical reaction or molecular construction.

You are the complete embodiment of this new field of thought and endeavor. You received your Bachelor's degree in Mechanical Engineering, your Doctor's degree in Chemistry. As you served, you constantly governed every thought and action by a consideration of all the factors involved. As a result, you made many valuable contributions to our progress. What is more important, however, is that in scanning the broad horizon which your vision revealed, you have been a shining example and showed the way to countless others who, by following in your footsteps, will undoubtedly, in the years which lie ahead, contribute much more to our progress.

Walter Julian Hamburger, it is a pleasure, an honor and a privilege to present this 1956 Olney medal to you.



Dr Hamburger (right) receives the Olney Medal from President Jacoby

Dr Hamburger delivering the address of the Medalist

ADDRESS OF THE MEDALIST

"Science in Industry— The Challenge to Textiles"

WALTER J HAMBURGER
Fabric Research Laboratories, Inc

The daily press and the periodicals as well, have for some time past devoted considerable space to discussions of a subject of great importance to industry in these United States. That subject is the growing shortage of scientific and engineering personnel and its impact upon technological supremacy and the national welfare.

The fact that these discussions have seldom appeared in the textile press is distressing indeed and an indication that science and engineering are believed either to be of less importance to the textile industry than to other industries, or to be of no importance to the textile industry whatsoever. And at this point it might be well to define the term "textile industry," as used in this paper, as all units of textile industrial activity *except* those which produce textile fibers by synthetic means (and portions of the chemical and dyestuff industries). The segment of the industry which produces fibers by synthetic means, namely, the chemical industry, has reached its present level of accomplishment by virtue of the fact that it has *long* recognized the value of science and engineering applied to the development of its products. It has never been satisfied simply to "know what" about these products, rather it has painstakingly sought "the how" and "the why" of their behavior and the importance of these facts to textile developments in general. It is certainly not necessary at this time to reiterate the impact which synthetic fibers have made on the textile industry, but it will be interesting to analyze the scope of science and engineering which are today encompassed in their production.

The synthetic fiber producers today offer unlimited opportunities in areas of interest to scientists and engineers since their activities provide problems in practically every field of pure and applied science and in engineering.

Consider the scope of a modern research laboratory of a synthetic fiber producer, from the point of view of fields of science and engineering required by today's rapid pace of scientific achievement. Such a laboratory must be a center of analysis where the talents of different academic disciplines are brought together for the purpose of accelerating the solution of complex problems.

The old philosophy that the chemical industry deals solely with chemical problems and that the industries involving the mechanical arts have no need for chemists, is rapidly giving way to the more modern concept which demands cutting across the imaginary or artificial boundaries of the pure and applied sciences and engineering by the efficient use of research teams. It is far better in the cause of research, to draw upon the knowledge and experience of a specialist who is a member of a versatile team, than to attempt to make a "short term expert" by, for example, sending a chemist to the library to "read up" on some aspects of mechanical engineering and expect him to succeed in competition with a trained, experienced mechanical engineer—or vice versa.

To implement this modern concept of an extensive versatile staff working closely together in the process of efficient problem solving, the modern research laboratory previously referred to would have available on its staff specialists in most of the following disciplines and fields: *Chemistry*———analytical, inorganic, organic, physical, polymer and biochemistry; *Physics*———mechanics, heat, electricity, optics, nuclear; *Engineering*———chemical, mechanical, electrical, structural, hydraulic, aerodynamic.

Carothers succeeded in producing a unique fiber-forming polyamide manifesting hitherto unheard-of textile fiber properties. The chemistry of the fiber was well established in the original patent. Problems involving mechanical behavior of nylon and which cut across the fields of chemistry, physics, mechanics and electricity, however, still remain unsolved and a challenge to chemists, physicists and engineers alike.

Nature succeeded in producing several unique fibers which manifest many properties which neither the chemist, the physicist nor the engineer have thus far been able to reproduce; and these fibers and their properties also present unsolved problems and challenges to scientists and engineers. These natural fibers have been with the textile industry for thousands of years, yet it is only relatively recently that any interest in "the how" and "the why" of these stalwart materials has been evidenced, and then *not* by the textile industry in general.

Now what has all this to do with the hue and cry about the shortage of scientists and engineers? Just this.

The textile industry, whether it likes it or not, is rapidly approaching the time when it will be called upon to produce engineering materials such as actual structural elements composed in large part of orthodox textile fibers, yarns and fabrics, but combined in unique forms which at this writing are certainly unorthodox. But if this statement seems a bit ambitious, there can be no doubt about the fact that some segments of the textile industry have already created a demand for apparel fabrics for which claims are made which place them in a category of engineered materials. "Wash and Wear," "Ease of Care," "Drip-Dry," "Miracle Fabrics" and many other similar connotations have established in the minds of the consumer the facts that such fabrics are indeed available, and in many instances that their performance has reached a state of perfection far beyond present practical possibility.

To succeed in this era of expanding science demands imagination, enthusiasm and application of sound principles. The examples of engineered materials cited above embrace the first two requirements, but the third is, to say the least, somewhat lacking, for the textile industry is not behaving "research-*wise*." Now is this because it cannot be research-*wise*? Certainly not, it has an almost fantastic potential from which to reap the benefits of research, if it will but equip itself before it is too late! Its deadline will be governed by the available supply of scientific and engineering personnel, *and the willingness of such personnel to cast their lot with the textile industry* in competition with other industries which apparently offer so much more.

These other industries apparently offer so much more only because the textile industry makes no bid for scientific and engineering personnel and as a result has not made known, through any concerted effort, the overwhelming opportunities which are available to young scientists and engineers in all branches of the textile industry.

As a result, a very poor opinion of the textile industry prevails in the minds of available young men and women. To them the textile industry is a blind alley of employment for many reasons:

1) As an industry serving one of the three necessities of life, food, clothing and shelter, its record of research expenditure is disappointing.
2) The textile industry is unstable profit-wise and as such in past decades has not made a good showing.
3) Management on the whole is not research conscious, and if conscious, not research minded.
4) To join the textile industry is to allow the sharp edge of their specialties to become dulled by lack of forward-looking research programs.
5) The experience gained in the textile industry will be no credit if they later change to employment by another industry.
6) There is little chance of advancement to the management level where research is not sincerely a part of the company policy.
7) And of greatest significance—the average science or engineering graduate today has no idea of the scope of textile science as a field of specialization. (But this is not surprising, since nowhere is he told of its great opportunities for achievement.)

Considering the foregoing, it is rather certain that if the textile industry wanted scientists and engineers as of today, it would be difficult, if not impossible, to recruit even the barest quota of scientific personnel in the face of other competition. Anyone who doubts these facts need only to review the want ad portion of the *New York Times* to find that not one such ad appears from the textile industry as defined earlier in this paper; but in passing, it is interesting to quote, from the July 8th *Times*, a portion of an ad placed by a fiber producer.

"Research Chemist or Physicist"

"Ph D in physics or physical chemistry with some research experience. To evaluate properties of fibers in order to assess the ultimate potentiality in end use applications OR to measure the optical and physical properties of fibers and to correlate these properties with fiber structure and textile performance." "This is a permanent position immediately available in ..... 's growing research laboratories in ....., ... It can provide wide opportunity for forward looking researchers as the company continues expansion in the textile, chemical and plastic fields."

The textile industry is beginning to recognize that sound research programs are more and more becoming an absolute necessity for survival. One of the large textile companies which discontinued its development research activities after World War II is now taking active steps to build a properly balanced research program which can most effectively be integrated into its widespread operations. The program contemplates research activities within the organization as well as research activities with consulting research laboratories. Other members of the textile industry are surveying the problem as it applies to

individual company requirements, and of course those relatively few companies which have well conceived and efficiently operating research units are striving to keep their organization tuned to the highest pitch of modern scientific methods and equipment.

It must be obvious that if the fiber producer requires the versatility of a well balanced staff as previously discussed, then the textile industry laboratory certainly will not be able to do with less, since its material problems run the gamut from fiber to finished product and its equipment problems are becoming more and more complex as time goes on. The requirements which are now and which will in the future be demanded of producing equipment introduces an entire new branch of textile science, namely, that which deals with the reaction of textile materials with processing equipment elements at ever increasing operating speeds. This phase of textile research, sometimes referred to as "dynamics of machinery" is engaging the keen interest of imaginative researchers everywhere. Whether the problems of this new branch of textile research will be dealt with by the machinery manufacturers or by the textile producing segment of the industry has not yet been established, but the need is so great for action along this front both from a quality basis and from an economic basis, that its introduction into textile science and research is assured.

Work in this field is already in progress in at least one university and one consulting research laboratory, and there is no doubt of its rapid expansion in the near future.

Automation is a common word today in reference to industry-wide process modification. It is not generally associated with the textile industry for many obvious reasons which will not be discussed here. However, there is a trend toward automation in the concepts that fibers can be handled with greater efficiency by the application of principles of aerodynamics, fluid mechanics and electrostatics, and it would not be surprising to see some revolutionary methods introduced—even into the textile industry.

It appears from the foregoing that the research needs of the textile industry, in terms of manpower are even greater than are those of the fiber producer. If this is true, and there is every evidence that it is absolutely true, the opportunities which can be offered by the textile industry in science and engineering are at least as great as are the opportunities offered by other important industries in the United States. The challenge which faces the textile industry today is twofold. First, it must sincerely embrace research as a sound philosophy, and having done so, it must establish adequate facilities for its execution. Second, it must communicate to the scientific and engineering fraternity the fat that it has "opportunities unlimited" to offer young men who seek a challenging future in their respective specialties. This can only be accomplished by a concerted, *combined* industry-wide effort to describe in detail what the textile industry has to offer and to make the presentation in such a convincing fashion that it will emerge as a top competitor for the limited supply of men and women who comprise the new body of scientists and engineers each year.

The extent of the success of such a promotional program will have a marked bearing upon the ability of textile science to become recognized as the worthwhile area of scientific endeavor which it truly is and an equal bearing upon the survival of the textile industry in a world of increasing demand for scientific and technological achievement.

Membership Applications—

(Concluded from page P856)

Robert A Lewis—Senior technician, Celanese Corp of America, Charlotte, NC. Sponsors: A F Tesi, C S Clutz

Frank S McAllister—Lab technician, Mooresville Mills, Mooresville, NC. Sponsors: C Neal, V C Smith

Everett E Miller—Assist to chief chemist, USF-Aspinook Finish Div, Gera Corp, Aspinook Plant, Jewett City, Conn. Sponsors: M J Quigley, E W Counsell

Jane E Myers—Lab assistant, Para-Chem Inc, Philadelphia, Pa. F J Demaria, D W Robinson

Alfred A Ruggiero—Finisher, Fair Lawn Finishing Co, Fair Lawn, NJ. Sponsors: A G Helmus, H Moore

Isidore Schnopper — Chemist, US Customs Lab, New York, NY. Sponsors: S Goldman, G H Davis

James H Schoenfeldt—Lab supervisor, Van Raalte Co, Inc, No Tonawanda, NY. Sponsors: J G Kern, A M Viditzward

John F Soteriou—Dyer, Fair Lawn Finishing Co, Fair Lawn, NJ. Sponsors: A G Helmus, H Moore

Lawson M Wise—Chemist, Mooresville Mills. Mooresville, NC. Sponsors: C Neal, V C Smith

JUNIOR

Robert E Mattson—Textile chemist, Joseph Bancroft & Sons Co, Wilmington, Del. Sponsors: G A Billingsley, R C Squier

ASSOCIATE

Edward M Brazo—Customer contact man, Fair Lawn Finishing Co, Fair Lawn, NJ.

Roland L Collet—Purchasing agent, Fair Lawn Finishing Co, Fair Lawn, NJ.

Marlene W Flewwellin—President, Wilcris Chemical Corp, New York, NY.

Nicholas J Giglio—Head examiner, Far Lawn Finishing Co, Fair Lawn, NJ.

Vladimir J Houska—Group leader, Materials Group, Dev Dept, Bakelite Co. Bound Brook, NJ.

Ronald A Padovani — Dyer, Fair Lawn Finishing Co, Fair Lawn, NJ.

Charles W Stillwell—Research Div, mgr, Dennison Mfg Co, Framingham, Mass.

APPLICATION FOR TRANSFER TO SENIOR MEMBERSHIP

Donald W Belcher
Frank J Feeny

STUDENT

Allan R Flickstein — Philadelphia Textile Institute. Sponsor: W H Hughes

Richard Freligh—Philadelphia Textile Institute. Sponsor: W H Hughes

James C Lang—Philadelphia Textile Institute. Sponsor: W H Hughes

Edmund L Liguori — Philadelphia Textile Institute. Sponsor: W H Hughes

Teodoro T L Sylianco — Philadelphia Textile Institute. Sponsor: W H Hughes

Rauf Tabani—Philadelphia Textile Institute. Sponsor: W H Hughes

Manuel Andrade — Rhode Island School of Design. Sponsor: H B Sturtevant

Katharine S King — Rhode Island School of Design. Sponsor: H B Sturtevant

Yoon-Chai Lee — Rhode Island School of Design, Sponsor: H B Sturtevant

Byron P McGinn — Rhode Island School of Design. Sponsor: H B Sturtevant

No Su Kim—Lowell Tech Institute. Sponsor: G R Griffin

Stanley E Sledziewski—Lowell Tech Institute. Sponsor: G R Griffin

Activities of the Local Sections

Mid-West

THE 1956 Fall Meeting of the Mid-West Section was held October 27 at the Bismarck Hotel, Chicago, Ill, with approximately 69 members and guests in attendance for the afternoon session, and 94 present for dinner and the evening session.

At the afternoon session, dates for subsequent meetings of the Section were announced as follows: Feb 16 (Bismarck Hotel); Apr 27 (Netherland Plaza Hotel, Cincinnati, O); June 14-15 (Outing—Browns Lake Resort, Burlington, Wis). Elliott Morrill, chairman of AATCC's 1958 National Convention to be held in Chicago, gave a preliminary report on plans.

The following officers were elected for 1957, following their nomination by J Gordon Stott, chairman of the Nominating Committee, and unanimous election by the members present: *Chairman*—Samuel M Littlejohn, Munsingwear, Inc; *Vice chairman*—Jack G Kelley, E I du Pont de Nemours & Co, Inc; *Secretary*—Warren B Broadbent, Geigy Dyestuffs; *Treasurer*—Kenneth M Harms, Mor gan Dyeing & Bleaching Co; *Councilors*—Joseph H Jones, Phoenix Dye Works, J Gordon Stott, Ciba Co, Inc, and Eric Camp, National Aniline Div; *Sectional Committeemen*—William C Snead, Textileather Corp, William O Fischer, Milwaukee Dye and Bleaching Co, H T Latham, E I du Pont de Nemours & Co, Inc, and Frank H Gurry, Aurora Bleachery, Inc.

Speaker of the afternoon was James F Whalen, Jr, Becco Chemical Div, Food Machinery & Chemical Corp, who spoke on "Bleaching with Hydrogen Peroxide."

The evening speaker was Walter H Hindle, Chemstrand Corp, who discussed "The Chemnyle Process for Dyeing Filament Nylon."

Standing: **Joseph H Jones, Phoenix Dye Works, national vice president, AATCC; Jack G Kelley, E I du Pont de Nemours & Co, Inc, vice chairman elect; Warren B Broadbent, Geigy Dyestuffs, secretary.**

Seated (l to r): **Walter H Hindle, Chemstrand Corp, guest speaker; Arthur I Hultberg, Bear Brand Hosiery, retiring chairman; Samuel L Littlejohn, Munsingwear, Inc, chairman elect.**

(L to r): **C Edward Hall, Mishawaka Rubber & Woolen Mfg Co; Daniel P Knowland; Leroy C Voss, Geigy Dyestuffs; Eric W Camp, National Aniline Div, councilor; William H Bultman, The Best Foods, Inc; L B MacFarland, American Aniline Products, Inc, councilor; Elliott Merrill, The Best Foods, Inc, candidate for vice president, AATCC; Arthur T Brainerd.**

(L to r): **Jake Larch; Walter H Sites, Ciba Co, Inc; Jerry Ferricks; J Gordon Stott, Ciba Co, Inc; councilor; Gerhard R Kremers, Strutwear Inc; James T Scoon, Kenosha Full Fashioned Mills, Inc; Marcus O Kremers, W B Place & Co**

(L to r): **Chester Brown; Roger G Carr, Geigy Chemical Corp; F Harry Proudfoot, Nyanza Color & Chemical Co; Hugh H Thorpe, Real Silk Hosiery Mills, Inc; Dick Labbe; Ted Atkinson; Joseph G Baric, E I du Pont de Nemours & Co, Inc**

(L to r): **Albert R Breen, Gaston County Dyeing Machine Co; William Graham, E I du Pont de Nemours & Co, Inc; Matthew M Surak; Raymond L Burnett, E I du Pont de Nemours & Co, Inc; Norman G Koehler, Geigy Dyestuffs; Fred Furchland; Eric O Appeltofft, Alexander Smith, Inc; Charles Gregg**

Activities of the Local Sections

New York

THE New York Section held its first meeting of the '56-'57 season on October 19 at Kohler's Swiss Chalet, Rochelle Park, NJ, with 140 in attendance.

During the business session, the following Nominating Committee was named: Weldon G Helmus, *chairman;* Ralph Fischer, and Arthur Wachter. A request was made of the members to send in nominations for councilors as soon as possible inasmuch as there will be three vacancies in the New York delegation as of January 1, 1957.

The technical session featured two papers: "Wet Processing of Lurex" by Leon B Seidel, The Dobeckmun Co, and "The Random Tumble Pilling Tester" by A G Scroggie, E I du Pont de Nemours & Co, Inc.

Group assembled during October 19th meeting of the New York Section includes:

Kneeling (l to r): **Harold W Steigler, director of research, AATCC; Leon B Seidel, The Dobeckmun Co, guest speaker; Richard E Miller, Eastman Chemical Products, Inc, treasurer, N Y Section; Richard P Monsaert, Jr, Puritan Piece Dye Works, secretary, N Y Section; and Michael F Costello, Jacques Wolf & Co, chairman, Membership Committee, N Y Section**

Seated (l to r): **A G Scroggie, E I du Pont de Nemours & Co, Inc, guest speaker; Charles A Sylvester, E I du Pont de Nemours & Co, Inc, chairman, Technical Committee on Research, AATCC; George Paine, executive secretary and assistant treasurer, AATCC; Charles W Dorn, chairman, Executive Committee on Research, AATCC; George O Linberg, Synthron, Inc, chairman, National Convention Committee, AATCC, and candidate for president, AATCC; Donald E Marnon, American Aniline Products, Inc, chairman, N Y Section**

Standing (l to r): **William F Brommelsiek, Forstmann Woolen Co, Councilor, P J Wood, Royce Chemical Co, past president, AATCC; Frederick V Traut, Globe Dye Works Co, vice president, AATCC; Weldon G Helmus, Fair Lawn Finishing Co, Sectional Committeeman, N Y Section, and candidate for vice president, AATCC; John A Komninos, Waldrich Co, vice chairman, N Y Section; and Matthew J Babey, American Cyanamid Co, chairman, Technical Program Committee, N Y Section**

HEAD TABLE (l to r): Paul J Luck, Peerless Color Co, Inc, councilor; Weldon G Helmus; Harold W Steigler; Charles W Dorn; Charles A Sylvester; Matthew J Babey; Arthur G Scroggie; Leon B Seidel

HEAD TABLE (l to r): Donald E Marnon, George P Paine, George O Linberg, Frederick V Traut, Richard E Miller, John A Komninos, Richard P Monsaert

Informal dinner preceding October 19th meeting of the New York Section

Philadelphia

THIRTY-SIX students from concerns in five states are registered for the special course in "Fabric Construction" sponsored by the Educational Committee of the Philadelphia Section in cooperation with the Philadelphia Textile Institute. The course is being presented by Frank L Giese, professor in charge of fabric design and development at PTI.

The six lectures, planned as basic information to dyers and slanted toward recognition of potential trouble or specific handling in dyeing, specifically cover: weave formations, fabric construction, basic raw materials, fabric qualities, yarns and yarn numbering, end use of fabrics, potential faults apparent in greige goods and their effect on dyeing and potential faults not apparent in greige goods but made noticeable by dyeing.

The lectures are presented on Monday evenings at 7:30 PM on the PTI campus.

PARTICIPANTS IN "FABRIC CONSTRUCTION" COURSE

1st row (l to r): **Chloe Rhoads, Irene Gilbert and Ruth Becker, United Piece Dye Works; Ada Chambers, Scholler Brothers; Prof Frank L Giese, PTI; Nancy Dalton, Millville Mfg Co; Sandra Tome and Gloria Gehman, UPDW; Gerald Barry, E I du Pont de Nemours & Co, Inc**

2nd row: **Stanley Rosner and Frank Wilken, UPDW; Arthur W Etchells, Hellwig Dyeing Corp; Issac P Davis, American Viscose Corp; Robert P Graupner, Scholler Bros; John H Davids, Quaker Chemical Products Corp; R B Stehle, Brehm & Stehle; Frank H Riale, Allentown Converting Co; William H White; John W Auman, Althouse Chemical Co; William Breitenbach, Baldwin Mfg Co; Robert L Hunter, Du Pont**

3rd row: **Richard M Axtel and J J Newton, Millville Mfg Co; Albert Stutzke, Globe Dye Works Co; Richard Correll, Blue Ridge Textile Co; Elwood Munz, Edmund Martin and Wilson Greenwood, Globe Dyeworks Co; Harold E Bailey; Thomas H Hart, Hart Products Corp; Clarence Seibert, Scholler Bros; Donald W Robinson, Para-Chem, Inc; Edwin Gottlieb, Aldon Rug Mills**

Employment Register

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the secretary of the Association, Post Office Box 28, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the secretary.

56-13

Education: Bradford Durfee Technical Institute—graduated 1951—BS textile chemistry; City College of New York—industrial management and psychology.

Experience: Six years chemist and head dyer—natural and synthetic fibers.

Age: 29; married, veteran. References; no location preference. Position desired: production manager, dyer-chemist.

56-14

Education: Bradford Durfee Technical Institute, 1951, BS, textile engineering; Norwich Univ & Mass State College, army specialized training; Boston Univ, business law (one summer).

Experience: 4 years dyeing and finishing natural and synthetic fibers; sales representative.

Age: 29; single, veteran. References; no location preference. Position desired: sales engineering.

11-19, 12-3

NOTICE TO AATCC MEMBERS

IN the event of a change of address, be sure to notify the secretary's office, AATCC, PO Box 28, Lowell, Mass.

CORRECTION

YOUR attention is called to a correction in Table IV, page P829, of the November 5, 1956 issue of ADR.

This table, which appeared in conjunction with the article "Effect of Resin Finishing on the Light Fastness of Vat Dyes," is corrected to read as follows:

Code no. of dye	Time of exposure in Fade-Ometer —10 hours— C	E	M	—20 hours— C	E	M	—40 hours— C	E	M
11-L	3	3	3	2	2	2	1	1	1
11-H	4	4	4	3	3	3	2	2	2

News of the Trade

VDI Launches Information Program

To present the full story of what vat dyes can mean to the trade and the consumer, the Vat Dye Institute, a newly formed nonprofit organization composed of leading US vat dye manufacturers, is launching a lively informational program employing advertising and public relations on a broad scale.

The program is expressly designed to acquaint converters, ready-to-wear and home furnishing manufacturers, retailers and consumers with the superior colorfast qualities of vat dyes, used principally in dyeing cotton, viscose rayon and linen, and some blended fabrics. The campaign theme is, "You can hang your hopes on lasting beauty . . . when the fabric is vat colored."

It is the Vat Dye Institute's purpose to demonstrate the actual economy of fabrics colored with vat dyes, and thereby combat any tendency toward subordinating color quality in favor of lower costs.

Through the promotional campaign, it is expected that buyers will become more and more informed as to which articles of clothing and home furnishings contain superior vat dyes.

Members of the Vat Dye Institute include: National Aniline Div, Allied Chemical & Dye Corp; American Aniline Products, Inc; American Cyanamid Co; Arnold Hoffman & Company, Inc; Belle Chemical; Chemical Manufacturing Co, Inc; The Dow Chemical Co; E I du Pont de Nemours & Co, Inc; General Dyestuff Co, division of General Aniline & Film Corp; Otto B May, Inc; Merto Dyestuff Corp; Pharma Chemical Co and Toms River-Cincinnati Chemical Corporation. These dye manufacturers are said to produce all of the anthraquinone derivations, and Indigoid and Thioindiogoid types in the United States.

The officers are: Douglas C Newman, director of sales, Organic Chemicals Dept, Dyes & Chemical Division of E I du Pont de Nemours & Co, Inc, *president;* Keith R J Horner, Toms River-Cincinnati Chemical Corp, *senior vice president;* E R Herbertson, vice president, Arnold Hoffmann & Co, Inc, *vice president;* and H J Daigneault, vice president, National Aniline Div, Allied Chemical & Dye Corp, *treasurer.* Henry F Herrmann is permanent executive secretary.

Board of directors includes: Mr Newman; J L Naylor, American Cyanamid Co; E M May, Otto B May, Inc; T C Keeling, American Aniline Products, Inc; and J R Bonnar, General Dyestuff Co.

The Vat Dye Institute office is located in room 8010, Empire State Building, 350 Fifth Avenue, New York 1, NY.

Henry E Millson, Organic Chemical Div, American Cyanamid Co (left) and Fred Fortess, manager, Dyeing and Finishing Laboratories, Celanese Corporation of America, winners of American Dyestuff Reporter Award, 1955 and 1956, respectively, are shown at a recent technical seminar for staff members, Applications and Product Development Department, Celanese Corporation of America, held at the Company's Textile Division Headquarters in Charlotte, NC. Mr Millson, the guest speaker, discussed "Use of Microdyeoscope in the Study of Dyeing at High Temperatures," the study for which he received the 1955 American Dyestuff Reporter citation. Mr Fortess, chairman of the meeting, received the 1956 award for his paper, "Dyeing, Finishing and Heat-Treating Arnel Triacetate."

Cellofilm Announces Ownership Change

Cellofilm Industries, Inc, Woodridge, NJ, producers of nitrocellulose-base solutions, has announced a change in ownership.

Since its establishment in 1916, Cellofilm has been operated as a subsidiary, owned jointly by Universal, Paramount, and RKO, prominent motion-picture producers. Cellofilm has recently been purchased by a new group who will provide direct management of the organization, as well as primary ownership responsibility. Henry and Stanley Eysmann, long associated with the company, will remain under the new ownership, as will the technical staff. Arthur M Golden, newly appointed executive vice president, will assume overall responsibility.

$2 Million Dyestuffs Plant Dedicated in India

Private enterprise in India and the United States joined hands in India on October 14th as James Hill, Jr, chairman of the board of Sterling Drug Inc, New York, dedicated a new $2,000,000 plant near Bombay for the manufacture of synthetic dyestuffs for India's textile industry.

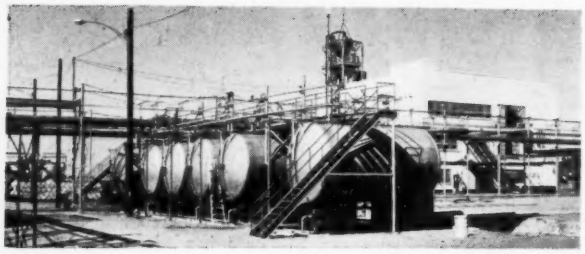
The plant, located at Kalyan, is a joint venture undertaken by Amar Dye-Chem, Ltd of Bombay, and Sterling. The American company has made a modest financial investment in the enterprise. Technicians of Sterling's Hilton-Davis Chemical Company Division, Cincinnati, supervised the design of the plant and trained Indian chemists and production personnel in American techniques of dyestuff manufacture.

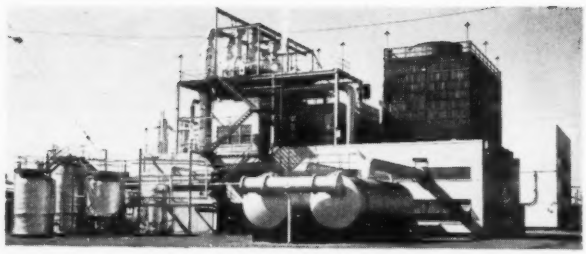
The dedication attracted an international audience of 2,000, including high-ranking representatives of the Indian and U S governments and prominent figures in Indian industry, commerce and finance. American participants were headed by William K Turner, Consul-General in Bombay. J H Doshi, managing director of Amar Dye-Chem, Nelson S Knaggs, vice-president of Hilton-Davis, John Pritchett, its chief development engineer, and William Kretzer, head of P Kretzer & Son, Inc, New York, consulting builders, had active roles in the ceremony.

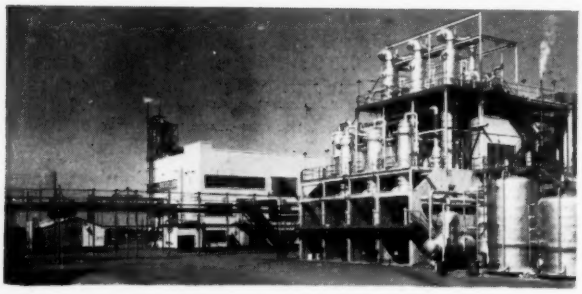
A plaque formally dedicating the new plant, which comprises 13 buildings and occupies 50 acres of land on the Ulhas River 40 miles from Bombay, was unveiled by Mr Hill, who called the plant "another milestone in India's growth which will be reflected in direct benefits to the Indian people."

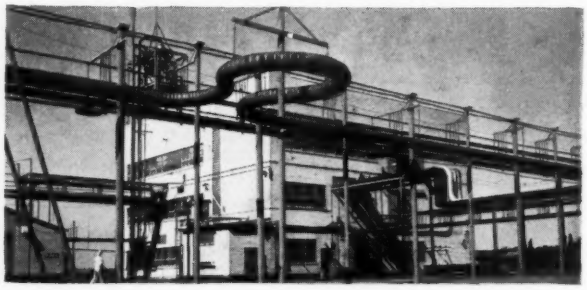
Mr Doshi will direct a staff of 350 chemists, chemical engineers, civil and mechanical engineers, and production employees. A number of these key technicians were trained at Hilton-Davis' Cincinnati plant since 1954.

When operating at capacity, the Kalyan plant will produce a complete range of dyestuffs, optical brighteners, and pigments. Amar-Dye Chem reportedly will be the first plant in India to manufacture naphthols and beta oxynaphthoic acid, a basic intermediate used to make naphthols. It will produce a wide number of fast bases, which react chemically with naphthols on textile fibers.









Solvay "Introduces" New H_2O_2 Plant to Press

The new hydrogen peroxide plant of Solvay Process Division, Allied Chemical & Dye Corporation, was "introduced" to the press at a luncheon held at the Harvard Club on October 23, 1956.

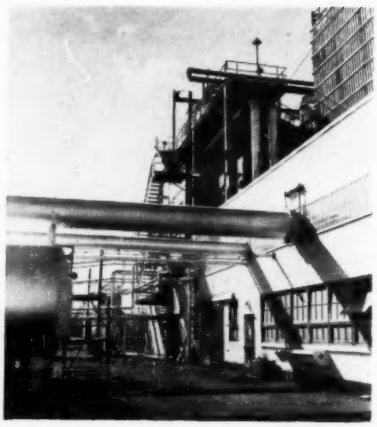
By means of a slide film, presented by D H Ross, Solvay's director of development, guests at the luncheon were shown views of the plant as well as end uses of this long-established chemical which recently has been finding increasing favor for a number of purposes.

In contrast with the older electrolytic method of producing hydrogen peroxide, Solvay's new process involves a chemical oxidation reaction, and the Company believes it to be the most advanced and efficient process developed to date for manufacture of this product. Involving catalytic hydrogenation and subsequent oxidation of complex organic materials, the new process results in the combining of by-product hydrogen from Solvay's adjacent electrolytic chlorine cells, with oxygen from the air, to produce hydrogen peroxide.

Long used in the textile industry as a bleaching agent, hydrogen peroxide has become increasingly popular as a result of improved techniques.

Practically all cotton textiles, both knit and woven, are produced from material which has been bleached with peroxide. In fact, hydrogen peroxide is used for bleaching about 80% of the United States production of white cotton goods.

Wool and silk bleaching is done almost exclusively with peroxides.



Five views of Solvay Process Division's New Hydrogen Peroxide Plant at Syracuse, NY

Other bleaching agents seriously attack the fiber or require elaborate operating controls. The new synthetic fibers are bleached with peroxide, but each offers special problems.

Some furs are bleached with peroxide for obtaining lighter shades, or before dyeing to various shades. Wool is carroted with peroxide in the manufacture of felt hats. This operation increases the felting properties of the fiber and aids greatly in shrinking and shaping of felt hats.

Increased use for paper bleaching has come about largely because of the ability of the product to upgrade ground wood pulp.

In recent years hydrogen peroxide has not only found wider application in the textile and paper industries but also moved into the field of plastic stabilizers and plastics.

The future appears to hold promise for hydrogen peroxide in other areas as well. A new and rather important use lies in the ability of hydrogen peroxide to upgrade vegetable oils to valuable plastic materials. In addition, it is moving into such advanced fields as rocket propellants.

Solvay's current research and future planning include production of higher concentration hydrogen peroxide required for such applications as rocket fuel and certain specific industrial uses.

Solvay's new plant can be easily enlarged and this, plus additional capacity which has been installed by other producers, ensures a stable supply situation such that new uses of hydrogen peroxide may be developed with confidence of an adequate supply.

Experts Complete Color Measurements Course

More than 90 experts representing international industry completed a week-long color measurments course September 28 at Portsmouth, NH.

Virtually every major company concerned with advanced industrial applications of colorimetry and spectrophotometry was represented at the course sponsored by General Electric's Instrument Department. All lectures were given by leaders in the field of textiles, chemistry, graphic arts and standards research.

The full schedule of daily lecture sessions were augmented by evening laboratory work with several General Electric recording spectrophotometers. All attendees were afforded ample opportunity to run color sample tests on the new devices.

Metro-Atlantic Building New Dye Application-Service Lab

Joseph Buonanno, president, Metro-Atlantic, Inc, in announcing the construction of the Company's new dyestuff application and service laboratory in Centredale, RI, has stated that it will greatly increase and expedite dyestuff service to all Metro-Atlantic customers.

Staffed by four dyestuff technicians under the supervision of Alfred McGregor, the activities of the laboratory will be directed by James Shore, technical director.

Equipped for the application and testing of dyestuffs, the laboratory's main functions will be standardization, application development, and service.

Some of the testing equipment will include standard Fade-Ometer, standard gas-fading oven, printing machine, vat ager, acid ager, Dornbusch inlay printing and embossing unit, padder, drycleaning and wash test equipment, and stainless-steel dyebaths.

Adjacent to the laboratory will be a completely equipped physical testing and air-conditioned room.

Metro-Atlantic, Inc, is the sales agent for Metro Dyestuff Corp, West Warwick, RI, and for Farbwerke-Hoechst AG, West Germany.

* * *

Two new stainless-steel closed vacuum and pressure reactors have been added to the manufacturing facilities at Metro-Atlantic, Inc. The addition of these reactors is said to make it possible for Metro-Atlantic to manufacture many more complex compounds at lower cost to the industry.

The reactors are stainless-steel jacketed, high-temperature 1000- and 2000-gallon units in which double reactions can be carried out at temperatures up to 600° F, using either pressure or vacuum. They are equipped with reflux condenser, agitators, steam distillators and full automatic controls.

The jacketed kettles are heated by a hot-oil system. Two hundred gallons of oil heated to any specified temperature up to 600° F are pumped at the rate of 200 gallons per minute through the heated jackets in these kettles.

Systems are equipped with cooling units so that the same system can be used in lowering temperatures. Both reactors can be used for manufacturing most textile auxiliaries.

The first new product made in these units is Emboset-Z, a cyclic urea fiber-reactant resin. This resin is now sold for crease resistance, for shrinkage control and low-chlorine-retentive finishes. Loss in tensile strength and discoloration in chlorine bleaching reportedly is kept at a minimum.

New closed vacuum and pressure reactors at Metro-Atlantic, Inc

Emboset-Z is applied to cottons for mechanical finishes, such as embossing and glazed chintz work. It is also used on spun rayon and mixtures with spun rayon in the dress goods and suiting field. It is said to produce an exceptionally durable finish.

Blickman Donates Model Dye Box to LTI

Lowell Technological Institute has received the donation of a model dye box from S Blickman, Inc, Weehawken, N J, for use in demonstrations in textile expositions and in the classroom. John J McDonald, head of the LTI finishing department, in acknowledging the gift, expressed his gratitude.

AAP Breaks Ground for New Sales Offices, Laboratories

The breaking of ground for the new laboratory and warehouse of American Aniline Products, Inc, a subsidiary of Koppers Co, Inc, Pittsburgh, took place at noon on October 23 at 4th Avenue and McLean Boulevard, Paterson, NJ.

AAP president, George L Armour, personally directed the ground-breaking ceremony as the first steam shovels went into action. Following the ceremonies, a special luncheon was held at the Hamilton Club, Paterson.

As noted earlier (page 709, Sept 10th issue), completion and occupation of the new building is expected in the spring of '57.

WW Symposium Scheduled

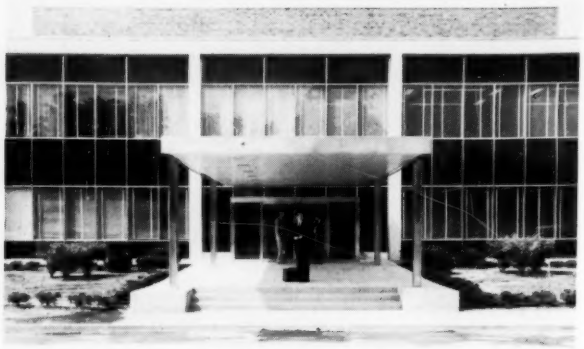
Plans for an industry-wide trade symposium on "wash and wear" fabrics next spring were announced last month by J Morton Curran, Jr, chairman of the Textile Section of the New York Board of Trade.

Cameron A Baker, United States Testing Company, Hoboken, NJ, and Jackson Spears, Burlington Industries, have been appointed cochairmen of the special committee on arrangements for the symposium, which will feature a panel of experts to discuss "minimum wear fabrics" problems from the weaving and finishing stages up to the consumer level.

Commenting on the need for the symposium, Mr Baker stated, "The variation between product performance and labeling claims, which has arisen from time to time, illustrates the urgent need for such a conference. There are serious gaps in knowledge on this subject," Baker continued, "from nomenclature at the consumer level back through the weaving, cutting, finishing, designing and yarn preparation stages."

"Such a discussion will prove valuable to retailers, merchandisers and advertisers of 'wash and wear' goods. With full understanding of the basic principles behind 'minimum care fabrics,' it is expected that unfortunate instances of exaggerated claims or actual mislabeling, which have occurred in the past as a result of incomplete knowledge, will be avoided" Baker concluded.

Architects' conception of the new offices, laboratories and warehouse of American Aniline Products, Inc to be built at Paterson, NJ



Modern entrance to National Carbon Co's new research laboratories at Parma, Ohio.

Typical of some 158 similar units in this research module at the Parma Laboratories. Each module is equipped with the scientific equipment necessary to carry out experiments in the particular field being studied, and is serviced with a wide variety of electrical voltages and gases. Movable metal partitions make it possible to rearrange individual research modules as required.

7th Major UCC Research Center

The recent dedication of new multi-million dollar research laboratories at Parma, Ohio, brings to seven the number of major research centers operated by divisions of Union Carbide and Carbon Corporation. The Parma laboratories are managed by the National Carbon Division.

Researchers at the new facilities are concentrating primarily on the fields of chemical and solid-state physics, electrochemistry, carbon and graphite and high-temperature refractory compounds.

The laboratories contain approximately 175,000 square feet of floor space and are located near the center of a 126-acre plot on Snow Road in a suburb of Cleveland. Designed for extreme flexibility, with provisions for expansion, the main laboratory building consists of 158 laboratory modules or individual research units. Approximately 350 employees including 150 scientific and technical personnel are at work there.

Price Cut for Cyanuric Chloride

American Cyanamid Company has made a fifteen-cent-per-pound reduction in the price of cyanuric chloride, a chemical intermediate used chiefly to produce optical brighteners.

Henry C Milton, manager of Cyanamid's Manufacturer's Chemicals Department, announced the cut and pointed out that it is in line with an eight-year trend.

The latest cuts bring the price down to $1.00 per pound in truckload lots and $1.10 per pound in less-than-truckload lots.

Chicago Address Change for National Aniline

The new address of the Chicago office of the National Aniline Div., Allied Chemical & Dye Corp, is now: Suite 430, The Merchandise Mart, Chicago 54, Ill. Telephone: MIchigan 2-1800.

5th Chemical Finishing Conference

Approximately 200 top textile technologists turned out last month for the Fifth Chemical Finishing Conference sponsored by the National Cotton Council of America. The two-day affair, held October 3-4 at the Hotel Statler, Washington, DC, was under the general chairmanship of J Marshall Cole, president, National Association of Finishers of Textile Fabrics.

The annual Chemical Finishing Conference is part of the Council's overall program to increase consumption of cotton and cotton products.

Mr Cole kicked off the Conference with his introductory remarks on Wednesday morning.

The Wednesday morning session, under the chairmanship of William M Segall of the National Cotton Council, featured the following papers: "Protective Treatments for Cotton Awnings," W Norbert Berard, Southern Regional Research Laboratory; "Stable Ultraviolet Light Absorbers," George M Gantz, Antara Chemicals; and "Preliminary Reports on Service Uses of Cyanoethylated Cotton Products," Jack Compton, Institute of Textile Technology.

Emery I Valko, Onyx Oil & Chemical Co, served as chairman of the Wednesday afternoon session, which featured the following presentations: "Water-Resistance — Water-Vapor Permeable Cotton Fabrics," Lyman E Fourt, Harris Research Laboratories; "Flame Retardants for Cotton Using APO- and APS-THPC Resins," Wilson A Reeves, Southern Regional Research Laboratories; "Preparation and Properties of Fully Acetylated Cotton," Edmund M Buras, Jr, Southern Regional Research Laboratory.

The Thursday sessions were handled by Mr Cole (morning) and Paul B Stam, Burlington Industries (afternoon).

Presented at the morning session were the following: "Comparison of Wrinkle-Resistant Finishes for Cotton," Theodore F Cooke, American Cyanamid Co; "Resin-Finished Fabric Properties and Curing Variables —A Simplified Relationship," Scott H Foster, Monsanto Chemical Co; "Mechanism of Crease Resistance with Dimethylol Ethylene Urea," Larry Q Green, E I du Pont de Nemours & Co, Inc; "Epoxy Resins in the Crease-Proofing of Cotton," Carl W Schroeder, Shell Development Co.

Afternoon session papers included: "The Application of Wrinkle-Resistant Finishes to Cotton Garments," Melvin D Hurwitz, Rohm & Haas

Co; "The Application of Crease-Holding, Wrinkle-Resistant Treatments to Cotton Garments by Drycleaners," Robert T Graham, National Institute of Drycleaning; and "SRRL Studies on Permanent Creasing of Cotton Fabrics," J David Reid, Southern Regional Research Laboratory.

The two-day affair was concluded on Wednesday evening with a "Mixer."

NYFD to Admit Designers and Stylists in Related Fields

New York Fashion Designers, the membership of which has been confined to designers of women's dresses and ensembles, blouses and children's wear, has decided to admit to its organization designers and stylists in related fields.

It is expected that through this liaison, it will be possible for all designers in all fields to discuss freely pertinent problems and fashion trends. This coordination is expected to bring the fashion industry together in one united effort to guarantee to the consumer the ultimate in service and fashion.

NYFD, the only coordinated designer group, is a cultural force in the industry and provides research facilities for all its members at its office at 1457 Broadway.

PTI and PTIF Trustees Hold Joint Meeting

The approval of an addition to the Hesslein Library, a new brochure, and the approval of the procedure to be followed in conducting the current fund-raising campaign was made by the members of the boards of trustees of the Philadelphia Textile Institute and the Philadelphia Textile Institute Foundation at a joint meeting and luncheon held at the Alden Park Dining Room, Philadelphia, Pa., on October 16.

Bertrand W Hayward, PTI president, and Richard S Cox, dean emeritus, spoke at the meeting about the problems confronting the school and the necessity of textile industry's cooperation in helping to bring about solutions. Alan M Richter, director of public relations at PTI, presented to the boards an outline of the procedure to be followed in conducting the current campaign. A specially prepared list of some 175 textile firms throughout the country was provided for the group with the request that each of the trustees select five or six corporations to whom they would take the story of the situation at the college.

Stein, Hall & Co, Inc's newly constructed Charlotte, NC plant office, laboratory and warehouse building

Typical laboratory facilities at Stein, Hall's new office, plant, warehouse and laboratory building at Charlotte, NC

Stein, Hall Opens New Charlotte Facilities

Stein, Hall & Co, Inc, officially opened its newly constructed Charlotte, NC, facilities on October 6th. Included in the new ¼ million dollar structure are office facilities for the firm's Charlotte sales branch, warehouse area, a manufacturing plant, and two modern, fully equipped laboratories—the Southern textile laboratory and the resin laboratory. The former is responsible for development of new textile products and offers general technical assistance to textile mills in the South. The latter engages in research on Stein Hall resins for the textile, paper, adhesive and other industries.

* * * *

Stein, Hall & Co, Inc, has announced also that its Canadian subsidiary, Stein Hall Ltd, has moved its Montreal branch to new and modern quarters where it has established an extensive laboratory designed to provide technical service for Canadian industry and to engage in product research.

Located at 8230 Mayrand Avenue, Montreal, the new branch and laboratory will be primarily concerned with textile specialty products. It will work on the development of printing, finishing, latex coating and warp sizing compounds geared to the specialized equipments of the Canadian textile industry. The laboratory will contain modern equipment including a padding machine, Launder-Ometer, coating machine, printing machine, oven, and many other devices.

TRI Seminar Schedule

The 1956 Fall Seminar schedule of the Textile Research Institute, Princeton, NJ, got under way on October 18th with Ludwig Rebenfeld of TRI presenting the topic, "Relation between X-ray Angle and Mechanical Properties of Cotton Fibers."

Dr Rebenfeld was followed on Nov 1 by Richard O Steele, Rohm & Haas Co, who discussed "Tear Strength of Fabrics," and on Nov 15 by John Menkart, TRI, on "The Significance of Crimp in Wool."

The remaining schedule is as follows:

Nov 29—Prof Frederick R Eirich, Polytechnic Institute of Brooklyn, "Interactions of Polyvinyl Pyrrolidone with Dyestuffs."

Dec 13—William G Klein, Fabric Research Laboratories, Inc, "Some Changes in Fabric Structure Under Biaxial Stresses."

Dec 27—Robert F Schwenker, Jr, Textile Research Institute, "Chemical Modification of Cellulose to Effect Flame and Glow Resistance."

Jan 10—Bengt Ranby, American Viscose Corp, "Properties of Cellulose Chains of Different Origin."

Jan 24—Joseph B Levy, Textile Research Institute, "Static Electrification of Filaments."

All dates are Thursdays and the seminars are held at the TRI laboratories at 2:30 pm. Advance notice of planned attendance will be appreciated.

These seminars are completely informal and no written reports are prepared.

Dayton Extending Line of Rubber-Covered Mechanical Goods

Mechanical products for use in all phases of textile manufacture now are being supplied by the Dayton Rubber Co, Dayton, O.

The company's line of rubber-covered mechanical goods for the textile field was extended recently with introduction of a custom-engineered dyeing and finishing roll.

Available in almost any diameter or length, the rolls can be made to meet almost any weight, size or pressure requirements.

Neutrazoic Dyestuffs

Neutrazoic dyestuffs, a new range of azoic colors, have been announced by the Atlantic Chemical Corp, Passaic, NJ, which claims that their use with the Riegel Flash-Acid Ager represents the greatest advance in high-speed, fast-color cotton printing since the development of stabilized azoics and pigments more than 20 years ago.

Chief benefits of the new dyestuffs reportedly are increased speed and reduction of seconds, which enable processors to make significant savings while producing prints of high durability.

Atlantic Neutrazoic Dyestuffs, products of Atlantic Chemical Corporation research, are naphthol-salt combinations stabilized through the use of special compounds, which are said to develop almost instantaneously in the Riegel Flash-Acid Ager.

The Riegel Flash-Acid Ager is a small, low-cost, compact machine, invented and used by the Riegel Textile Corporation. (Manufactured by Sims Metal Works, West Point, Georgia.) Geared to the take-off end of the print machine dry cans, it operates at all printing speeds.

Atlantic Neutrazoic Dyestuffs and the Riegel Flash-Acid Ager together create new printing procedures in which the material is printed, can-dried, flash-acid aged and swung into boxes at full speed, in one continuous operation. It is claimed that immediate inspection can be made at the doffing end of the print machine, and washing, which is optional, can be performed without concern for bleeding, since Atlantic Neutrazoics are faster to washing than ordinary stabilized azoics.

Atlantic Neutrazoics Dyestuffs are available as a complete range in standard strengths and azoic shades as solutions, double solutions and powders. No formula changes are required from presently used stabilized azoics.

For samples and literature, write Atlantic Chemical Corp, Dept ADR, 153 Prospect St, Passaic, NJ.

Wica Phosphorylamide

A new concept in permanent flameproofing of cellulose fibers was announced recently by William Caldwell, president of Wica Chemicals, Inc, Charlotte, NC. Wica Phosphorylamide is applied in cold padding operations, simply dried and cured at 290° F.

Mr Caldwell said that cellulose and Wica Phosphorylamide combine without the use of added catalysts or special conditions, and the highly versatile material does not offer the problems heretofore encountered in permanent flameproofing.

According to the report, an unusually wide variation of circumstances and additives have been employed, and all indications point to an almost unlimited degree of compatibility with other finishes and auxiliary chemicals. Solutions as dilute as 4% have been shown to suffice and concentrations up to 20% have been used without drastically affecting the handle of the impregnated fabric upon afterrinsing in cold water, it is claimed.

"Pile fabrics, flannels, velveteens, drills, ducks, canvases and uniform twills respond easily to treatment," Mr Caldwell said. "Drapes and other decorative fabrics with appreciable cellulose content are targeted for immediate interest and Wica Phosphorylamide is being considered for flameproofing of cellulosic paper and paper board products," he reported.

"The antistatic properties of Wica Phosphorylamide-treated fibers are being investigated, and its compatibility with a multitude of water repellents, lubricants, softeners, builders, thermosetting and the thermoplastic resins is credited for much interest and enthusiasm in the industries' long search for a much needed tool in these fields of specialty processing."

"A special department has been created at Wica Laboratories for the handling of technical problems, sampling and development of this new, unique flame retardant," Mr Caldwell said.

Wica Phosphorylamide is marketed as a 50% solution and is now available for industry-wide use.

Aquaprint Colors

For fast-color printing cottons and synthetics, Interchemical Corp, Textile Colors Div, Hawthorne, NJ, has announced an improved line of water-dispersible colors, known as Aquaprint® Colors. The colors in this series are applied to textiles in the form of pigmented oil-in-water emulsions or in the form of aqueous dispersions. They supplement Interchemical's Aridye® 400 Series Colors, which are applied in the form of pigmented water-in-oil emulsions. The improved Aquaprint Colors are said to have excellent linting qualities and to be non-tarnishing, thereby eliminating one of the major problems encountered heretofore in machine printing with pigmented emulsions of the oil-in-water type.

Like Aridye Colors, the improved Aquaprint Colors provide a wide range of brilliant shades which are claimed to meet stringent consumer requirements for fastness to light, washing, crocking, and drycleaning. They are said to be especially useful for printing dress goods, suitings, draperies and curtains, and various other types of fabrics requiring a high degree of fastness. Selected colors in the series provide excellent resistance to caustic cut-out in plissé work, it is claimed.

Aquaprint Colors are said to be suitable for both machine and screen printing on conventional types of equipment. For machine printing, Aquaprint Colors are generally applied in the form of oil-in-water emulsions; whereas for screen printing they are ordinarily used in the form of aqueous dispersions. Printing is carried out in the usual manner; no change in the regular set-up is necessary. It is stated that the colors, as printed, are final in shade, permitting the printer to detect and correct any defects immediately and to keep the pattern in fit throughout a run.

Specific advantages claimed for the Aquaprint Colors include exceptionally sharp marks and smooth blotches. Because Aquaprint Colors are water-dispersible, they facilitate cleaning of equipment, including print rollers, furnishers, back - greys, blankets, screens, and other equipment.

Aquaprint Colors reportedly can be employed alone or alongside Aridye Colors, stabilized azoic dyes and aniline black in the same pattern to provide color combinations which would be difficult to produce in any other way. When they are used alone or alongside Aridye Colors, the fabric, after printing and drying, is heat cured at an elevated temperature to polymerize the synthetic resins used as bonding agents for the pigments. When they are used alongside stabilized azoic dyes and aniline black, the fabric, after printing, is subjected to the same type of aftertreatment normally employed for those dyes. In some instances this is followed by heat curing to provide maximum fastness.

Improved Vatrolite

Improved Vatrolite, a dustless sodium hydrosulfite, offers many advantages to users in the textile industry, according to a recent announcement by A J Royce, president of Royce Chemical Co, Carlton Hill, NJ.

According to Mr Royce, new production and testing facilities at the Royce plant here in Carlton Hill make the improved Vatrolite considerably superior to the product formerly manufactured by the firm.

While Vatrolite was developed primarily for vat dyeing, it was pointed out that it is equally effective in stripping colors from cotton, rayon and other cellulosic fabrics.

Among the advantages cited by Mr Royce are ease of handling in dry chemical feeding devices and freedom from caking in caustic solutions. These advantages, he said, are due to the new Vatrolite's carefully controlled composition.

The product is dustless and of more uniform particle size than was the case in the past. Because of this, Mr Royce said, Vatrolite dissolves almost instantly. Therefore, pipe and gutter systems can not become clogged with undissolved hydrosulfite. A slow decomposition rate makes it possible to maintain vat colors in a reduced state for extended periods of time.

Vatrolite is said to be equally effective in pad-steam dyeing, reduced vat dyeing and indigo dyeing. It is said to have been found that addition of a certain amount of Vatrolite to the dyebath in dyeing sulfur colors aids in the prevention of bronziness and preoxidized, dark selvages when the dyeing is carried out on the jigger.

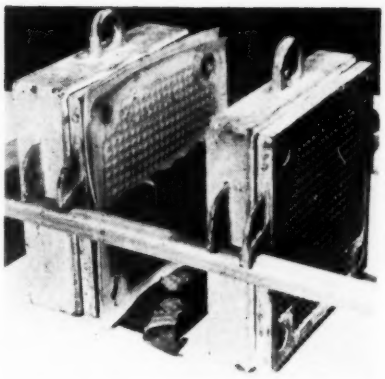
It is claimed to be highly effective in stripping direct colors from cotton, linen and rayon. It can also be used for stripping vat and naphthol colors with the aid of Dispersoll, another Royce product.

Improved Vatrolite is shipped in red and gold painted steel drums containing 250 pounds net. It reportedly will keep almost indefinitely provided moisture is kept out of the container.

Flare Red C-64

A new, more vibrant basic red has been added to the existing line of Celaperm acetate colors by Celanese Corporation of America.

The new color, designated as Flare Red C-64, was developed after extensive study of various market requirements. It reportedly provides necessary brilliance and clarity for many end uses. Celaperm colors are offered in a variety of deniers.



Quick and efficient cake formation and cake release ability of new Dynel Windsor Filter Felt is illustrated on this 7" x 7" Schriver Plate and Frame press, 306 DY-VE. The cake is composed of 95% McNamee clay and 5% carbon black.

Dynel Windsor Felt

A new type of nonwoven felt, engineered specifically for more efficient plate and frame filtration of aniline dyestuffs and pigments, has been perfected by American Felt Company.

Called "Dynel Windsor Felt," the new material is composed of Dynel, Union Carbide's acrylic fiber, combined with a required percentage of thermoplastic binder fiber.

According to Thomas J Gillick, director of engineering, American Felt Co, the unique cross-section of the Dynel fiber and the compactness created by the Windsor construction is responsible for a high-density structure capable of retaining extremely fine particle sizes without plugging. In fact, because of its uniform fibrous makeup, it retains smaller particles than is possible with a woven cloth.

Other significant advantages of the felt are said to be its rapid wettability, quick cake formation and easier cake release. Able to stand up under rugged treatment, it reportedly may be safely scraped and hose washed.

Although the Dynel felt is two to three times as expensive as cotton filter cloth, the normal standard for fine particle filtration, Mr Gillick points out that it lasts up to ten times longer than cotton. This greatly increased life factor, based on exhaustive tests under actual use conditions, is said to make the Dynel Windsor felt not only more efficient but more economical as well.

This durable felt, which may be handled like any industrial fabric, reportedly has a tensile strength of 2400 psi and an operating temperature range of anywhere from —20 to +150° F, without shrinking. Furthermore, it is said to retain its original dimensions through repeated wetting and drying cycles.

Highly resistant to chemicals, the Dynel Windsor Felt reportedly tolerates most strong acids, alkali and salt solutions and solvents. It is also said to be unaffected by bacteria, mold and fungi.

The felt is currently being produced in 40-yard rolls in standard widths of 72 inches. It is also available in widths from 44 to 76 inches or cut to special sheet sizes, depending on specific filtration requirements.

Distribution of the new filtration fabric is now being handled by American Felt's seventeen sales offices throughout the United States, as well as through three major distributors—Filtration Engineers, Newark, NJ; Flaherty Filter Fabrics, Irvington, NJ; and National Filter Media Company, New Haven, Conn.

Mr Gillick announced that American Felt Company is making its research staff and facilities available to filtration industry representatives to work out specific applications of the new Dynel felt.

Further information or samples of Dynel Windsor Felt may be obtained from American Felt Company, Glenville Road, Glenville, Conn.

Resyn 36-6254; 76-3930; 76-3944

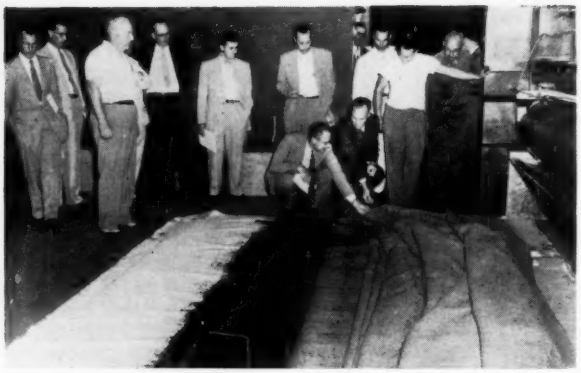
Three new adhesives for laminating work have been announced by National Adhesives Division, National Starch Products, Inc, 270 Madison Avenue, New York.

Resyn 36-6254 is formulated to laminate cellulose acetate butyrate to foil in the production of metallic yarn. It is a rubber based, light amber, transparent adhesive with a viscosity of 2500 cps. It may be thinned with MEK.

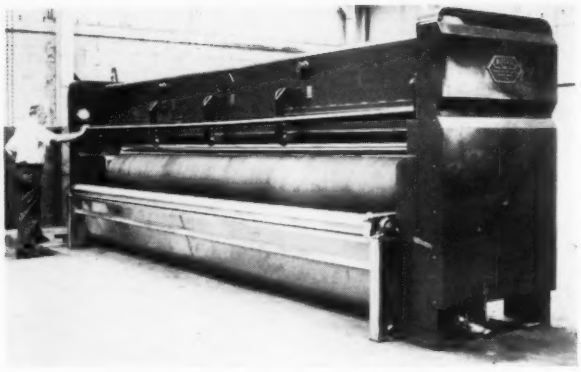
"Boilable" flexible containers are being made by laminating reverse printed cellulose acetate to foil with Resyn 76-3930. This adhesive is a light amber, clear liquid, vinyl lacquer with a viscosity of 500 cps. It should be thinned with an equal mixture of isopropyl acetate and toluene.

For laminating Mylar to metallized Mylar or Mylar to foil, Resyn 76-3944 is being used. It is an amber, translucent, rubber base adhesive with a viscosity range of 2000 cps. It may be thinned with MEK.

All three adhesives reportedly may be applied by reserve roll or gravure application, for best results, it is suggested that the adhesives should be applied to the foil. The coating weight should range from 1.5 to 2.5 lbs per ream. A drying temperature of 200-250° F with a "nip" temperature of 210-250° F is recommended by the manufacturer.



John Fletcher of the Du Pont Co and Gilbert Hopkins of Rodney Hunt Machine Co check the selvage of the widest tufted carpet (15 feet) dye padded to date. Tested recently in demonstration of the Rodney Hunt Machine Co's 17½-foot Niptrol carpet mangle before a group of industry executives, the sample showed no center-to-side shading and approximately 50% extraction.



Shown above is the new Rodney Hunt Niptrol carpet mangle, the largest yet constructed. This unit has a roll face width of 17 feet 6 inches and can be used for both dyeing and extracting tufted carpets up to 15 feet wide

Largest Niptrol Mangle Successful in Dye Padding 15-Foot Tufted Floor Covering

A specially built Niptrol carpet mangle with a 17½-foot roll face—the largest yet constructed—successfully dye padded a 15-foot wide tufted floor covering for the first time in a recent demonstration for the carpet industry at the Rodney Hunt Machine Co's Orange, Massachusetts, plant. Present to witness the test were representatives of American Viscose, Cabin Craft, Callaway Mills, Du Pont, James Lees, C H Masland, Mohawk Carpet and Sandoz Chemical Company.

The sample used in the demonstration was a 15-foot by 20-yard latex-backed fabric, composed of 90% viscose rayon and 10% nylon loop pile. Eighty gallons of Pontamine Fast Blue BLL was used as the dyestuff at one ounce per gallon of water at 180° F. The Niptrol unit was operated at 250 pounds per lineal inch pressure and 4 yards per minute.

After treated in a beck for 20 minutes in a bath of 3 ounces of salt per gallon of water at 180° F, followed by 10 minutes rinsing in cold water, the fabric did not change shade. Neither was there any migration of dyes. Swatches taken from left and right selvages and center showed excellent penetration and levelness of the dyestuff with no evidence of center-to-side shading.

This advance was made possible by the revolutionary design of the Niptrol mangle which, with its unique method of applying pneumatic pressure, eliminates the effects of roll deflection. Conventional equipment produces uneven pressure due to the sag of the roll, which results in shading of the fabric from center to side.

The Niptrol mangle, however, provides a uniform squeeze-roll nip through a segmented pressure-roll under overall uniform pressure. Pressure is applied by a pneumatic tube which runs the full width of the machine and bears on staggered brackets attached to the segmented pressure roll. Total pressure is distributed throughout the entire length of the upper squeeze roll to compensate at every point for the varying deflections of the support roll. High extraction (approximately 50% in dye padding) is realized by the use of a small stainless steel roll 4¾" diameter, supported against a larger diameter rubber support roll. At 250 pounds per lineal square inch pressure, a nip of approximately ¾ of an inch results.

The new wide Niptrol mangle, designed for incorporation into continuous finishing operations for the application of both vat dyes and direct dyes, achieves the high extraction and uniform pressure across the nip which are so essential in the dye padding of tufted floor coverings. The entire unit weighs 8 tons and is over 24 feet long including drive, 4 feet wide and 8 feet in overall height.

To the Niptrol unit itself was added a dye pan of 100-gallon capacity, constructed of Type 316 (18-12 MO) stainless steel with dye distribution pipe running from center to sides and fed from an outside mixing tank. The unit also incorporates air jet doctors for eliminating the possibility of dye being carried through the nip and being re-absorbed into the selvages.

Monomethylol Dimethyl Hydantoin

Monomethylol Dimethyl Hydantoin (MDMH) is now being produced commercially by the Glyco Products Co, Inc, Williamsport, Pa.

MDMH is offered as white crystals, practically odorless, with a melting point above 110° C. It is soluble in water, methanol and acetone. It reacts as a substituted hydantoin and as an almost odorless formaldehyde donor. Heat alone produces liquid, soft or hard, water-soluble polymers. It reportedly reacts with proteins such as glue, gelatin, soybean protein and casein which are insolubilized.

It is recommended by Glyco as an odorless formaldehyde donor in those cases where the odor of free formaldehyde is undesirable. MDMH reportedly contains 19% combined formaldehyde which is capable of liberation.

It can be used for modifying starch, textiles, fur, leather, paper and wood.

A three-page bulletin including detailed data on insolubilization of glue and casein is available from the Glyco Products Co, Inc, Empire State Building, New York 1, NY.

Emersoft® 7700

Emersoft® 7700, a new high-quality nonionic softener for textile finishing, is now available from the Organic Chemical Sales Department of Emery Industries, Inc, Cincinnati. Emersoft 7700 is said to provide softness at a low cost per yard and to offer substantial quality advantages for such varied cottons as broadcloth, twill, denim and ticking. The versatility of Emersoft 7700, including its stability over a wide pH range, permits its use in all cotton softening applications, it is claimed.

The product is a 95% active paste that is easily dispersible in warm water. Shipments is made in 55 gallon, open head, nonreturnable drums, in quantities up to and including carloads.

TECHNICAL LITERATURE

(It is understood that the following literature is available from the sources listed in italics).

ACID-RESISTANT CONCRETE FLOOR REPAIR — *Stonhard Co, Inc, Dept ADR, 1306 Spring Garden St, Philadelphia 23, Pa*—Six-page folder describes Stonhard's Stonpach, a material for patching or overlaying concrete floors ruined by acids, grease, oil, chemicals and other disintegrators.

APPLICATION OF LATEX TO TEXTILE AND ALLIED MATERIALS—*Natural Rubber Bureau, 1631 K St, NW, Washington 6, DC*—In this new 135-page book, C M Blow, prominent British scientist, uses text, diagram and picture to describe a wide range of uses in which latex can be applied to the benefit of textiles.

In his comprehensive work, which is available without charge as an educational service of the natural rubber industry, Dr Blow not only records what has already been done, but indicates new possibilities for rubber usage in this field and pin-points the important theoretical and practical considerations.

After a discussion of the general principles involved in the application of latex to textiles, the author goes into such specifics as treatment of yarns, thread, etc; fabric proofing, coating and impregnation; latex treatment of pile fabrics; artificial leather manufacture; latex applications to paper; the problem of adhesion of rubber to textiles and latex-bonded fibrous structures.

Also included in the book are abstracts of latex patents and information on designing equipment for using latex and textiles. an estimation of the rubber content of fibrous material, and a qualitative assessment of the distribution of rubber throughout a textile material.

This latest book is part of an educational series on the uses of latex sponsored by the natural rubber industry.

ASKANIA CLOTH GUIDE CONTROL *Askania Regulator Co, 240 East Ontario St, Chicago 11, Ill*—Bulletin 22.1, a fully illustrated 8-page booklet, explains the Askania Cloth Guide Control system as specifically applied to tentering, label marking, tubing and examining and slitting operations for textile mill installations. Included in the text are photos and descriptions of Askania Models available for light- and medium-duty service in the textile industry.

BENNINGER CHAINLESS MERCERIZING MACHINE FOR PIECE GOODS —*H W Butterworth & Sons Co, Bethayres, Pa*—Two new bulletins provide complete information on this machine, which utilizes the principle of tension mercerizing developed by Benninger during the past 20 years.

Bulletin 711-E contains a cross-sectional flow diagram of the machine, together with a detailed description of each stage of the chainless mercerizing process. This is the process which reportedly permits simultaneous treatment of two or four fabric layers, elimination of the necessity for stretching, and gentler treatment of fabrics.

Close-up photographs of many of the special features of the Benninger Chainless Mercerizing Machine demonstrate the design characteristics which contribute to operating efficiency and which permit continuous control of fabric lengths when running through several compartments of the machine. Included also are schematic drawings of the five machine sizes, a table of cloth passage possibilities, with various arrangements of cloth strips.

Pamphlet 558-E provides an illustrated answer to the question, "What is Chainless Mercerizing?"

BULK STORAGE OF HYDROGEN PEROXIDE—*Advertising and Sales Promotion Dept, Solvay Process Div, Allied Chemical & Dye Corp, 61 Broadway, New York 6, NY*—Detailed information on new equipment and simplified handling methods for storing bulk quantities of hydrogen peroxide is given.

The booklet includes data on construction and size of storage and measuring tanks, hose, piping and air compressor systems, valves, pumps and gaskets. It is illustrated with detailed drawings of the equipment and typical air and gravity transfer systems. Also included is a partial listing of names and addresses of equipment suppliers.

CATALOG—*Wm Hiergesell & Sons, 295 Pearl St, New York 38, NY*—Wm Hiergesell & Sons, manufacturers of thermometers, hydrometers and kindred instruments for industrial, laboratory and engineering requirements, has issued this 40-page catalog, which lists many hydrometer and thermometer items hard to find.

CAUSTIC SODA ENGINEERING AND HANDLING GUIDE—*Hooker Electrochemical Co, Niagara Falls, NY*—Technical service bulletin 102 (40 pages) is a file-size guide for safe handling and storage of liquid caustic soda.

The guide includes large detailed diagrams and photographs of tank cars, piping, and storage equipment, together with recommendations for unloading, dilution, transfer and storage. A portion is devoted to materials of construction, and in addition there is a section on safety precautions and first-aid treatment.

The bulletin also contains many graphs, charts, and tables covering physical data on liquid caustic soda.

CAUSTIC SODA HANDLING—*Westvaco Chlor-Alkali Div, Food Machinery and Chemical Corp*—This chart is about 20 by 16 inches in size, with bound ends, and is made for wall-hanging. It is printed in three colors and includes information on: how to use caustic soda safely, personal protective equipment, and first aid treatment. Space is left for the listing of emergency telephone numbers.

CUSTOM WORK, SERVICE ENGINEERING, INSTRUMENTS & EQUIPMENT FOR RESEARCH, CONTROL & PRODUCTION — *Custom Scientific Instruments Inc, 541 Devon St, Kearny, NJ* — Catalog No. CS-56 contains illustrations and brief descriptions of 37 instruments for testing textiles, plastics, paper, insulation, extensometers, dial indicators, light metals and other materials.

The following units are covered: *Abrasion Testers* — CSI-Stoll Quartermaster Universal Wear Tester, CSI-Stoll Flex Tester, CSI-Flex Tester (Special), CSI-Surface Abrader, Flex and Fold Machine, CSI-A Abrader, and the Armstrong Abrader; *Physical Testers*—SPI Flammability Tester, Electro-static Voltmeter, Electrical Resistance Tester, Pilling Tester, Celanese Wrinkle Tester, SMT Tensiometer, High Speed Recording Tensiometer, Accelerated Soil Tester, Mechanical Cotton Blender, Nep Test Machine, Mechanical Cleaner-Mixer, Automatic Alundum Guarded Hot Plate Console, and Pittsburgh Corning Thermal Conductivity Probe; *Thickness, Compression & Recovery Testers* — Armstrong Thickness Gauge, C & R Tester for Thickness, Compression and Recovery, Armstrong Indentation Machine, and Low Pressure Thickness Gauge; *Precision Checking Instruments* — CSI Microscope Stage, Templin Calibrator, Dial Indicator, CSI Dividing Head, and Rotary Table; *Scientific Instruments* — Ultramicrotome, CSI High Speed Angle Centrifuge, Hillemann Micromanipulator, Long-life Sieve, CSI Dry Ice Storage Cabinets, Plate Developing Tank (Model CS-6), and Specimen Punch.

CYANOETHYLATION OF COTTON —*American Cyanamid Co, Petrochemicals Dept, 30 Rockefeller Plaza, New York 20, NY; Monsanto Chemical Co, Plastics Div, Springfield, Mass; or the Institute of Textile Technology, Charlottesville, Va*—This detailed report, which has been prepared jointly, covers the cyanoethylation process, ie, conversion of cotton into a new fiber by use of acrylonitrile.

The report, written after several years of basic research on the subject by the participating organizations, discusses procedures of cyanoethylation, economics of the treatment and commercial use based on pilot-plant operations.

DEVELOPMENT OF CHEMICALLY RESISTANT, HIGH-TEMPERATURE PROTECTIVE FABRIC—*A S Kidwell, Connecticut Hard Rubber Co for Wright Air Development Center. Jan, 1956. 88 pages. $2.25. (Order PB 121212 from OTS, U S Department of Commerce, Washington 25, DC*—To protect personnel from brief exposure to chemical fires at temperatures up to 1000°F, a coated fabric of aluminum-pigmented polychlorotrifluoroethylene (polyfluoron) on glass fabric with a low density silicone rubber sponge was developed. The fabric is flexible and useful over a temperature range of —80°F to 390°F. Inside temperature rise of the fabric was less than 100°F after direct exposure to a fire of nitric acid and monoethylaniline. The fabric was nonporous to 1000°F steam, and was not penetrated by reaction products of ethyl aniline-fuming nitric acid combustion.

DICTIONARY OF TEXTILE TERMS — ENGLISH/GERMAN — GERMAN/ENGLISH—*$10.00; Pergamon Press, Inc, 122 East 55th St, New York 22, NY*—This new publication by M Polanyi answers the need for an up-to-date dictionary in English and German, as an aid to the understanding and use of technical and commercial terms in documentation, literature, correspondence, catalogues, machine operation instructions, etc.

The "Dictionary of Textile Terms" is a source for the current terms in textile technology, industry and trade. Specifically American terms are marked (A).

There are approximately 10,000 entries in each language under headings such as: fibers and yarns, operations, dyeing, shades, printing, finishing, waterproofing, mothproofing, fabrics, machinery, laundering, detergents, drycleaning, chemicals, carpets, hosiery, furs, plastics and many others.

DIRECTORY OF THE MEMBERS OF THE AMERICAN STANDARDS ASSOCIATION—*Dept PR, American Standards Association, 70 East 45th St, New York 17, NY*—The 115 national technical societies, trade associations and public interest groups, and the 2300 companies which are affiliated with ASA are listed in this new 63-page booklet.

It also names the officers and board of directors of the Association. Gives state and city governments, colleges and universities and various individuals affiliated with ASA.

DUSTLESS FORM OF SODIUM LAURYL SULPHATE—*Aceto Chemical Co, Inc, 40-40 Lawrence St, Flushing 54, NY*—describes the properties of dustless sodium lauryl sulphate in needle form (Solasol needles).

Besides offering greater emulsion stability, the needles are said to eliminate the irritating dust problem accompanying the use of conventional sodium lauryl sulphate powder. In addition, it is claimed that the high concentration of active matter permits greater flexibility in formulations using sodium lauryl sulphate, while at the same time permitting economies in storage and handling costs.

1957 EDITION—PHYSICAL PROPERTIES OF CARBIDE AND CARBON CHEMICALS — *Carbide and Carbon Chemicals Co, 30 East 42nd St, New York 17, NY*—More than 335 organic chemicals are described in this 24-page booklet (F-6136). Condensed data on applications are presented and physical properties are given in tabular form. An alphabetical index is included for the convenience of the user.

The 1957 edition features twenty-one new products, including Niatex antistatic AG-2. For easy reference, chemicals are arranged by family groups.

EFFECT OF DIAMETER ON RUBBER-COVERED SQUEEZE ROLLS — *Rodney Hunt Machine Co, Industrial Roll Div, Orange, Mass*—Report No. 10 on Industrial Rolls, one of a series published as an aid in the design and use of rolls for specific plant applications, provides useful information on the relationship of roll diameter pressure and area of nip contact.

It discusses, and illustrates with graphs, deflection of typical rubber rolls under various loads, how roll deflection affects performance across the full width of the roll, and how roll diameter influences nip width. It points out how, with limitations, variations in pressure along the rolls, which is caused by deflection with resultant uneven wear and possible rupture of the covering, may be corrected by crowning rolls. Mentioned also are the undesirable operational and maintenance problems introduced by crown-grinding of rolls. The Niptrol pneumatic mangle, which provides sharp nip and minimizes deflection, is also discussed and illustrated.

EFFECT OF LAUNDERING, MERCERIZING, AND SIMULATED VAT DYEING ON THE PROPERTIES OF PARTIALLY CYANOETHYLATED COTTON — *Southern Utilization Research Branch, 1100 Robert E Lee Blvd, New Orleans, La*—This is a reprint of an article by Robert M Reinhardt, Anthony R Markezich, Harry B Moore, and J David Reid.

Laundering, mercerization, and simulated vat dyeing will not seriously affect the serviceability of partially cyanoethylated cotton if original properties of the modified cotton are acceptable. This is the conclusion reached by research workers at the Southern Utilization Research Branch of the Agricultural Research Service, USDA, after a series of tests to determine the effects of such treatments. The information should be useful in evaluating the potential usefulness of such fabrics.

Untreated samples, and samples treated with 2% sodium hydroxide solution, were used for comparison with samples of the same kind of material cyanoethylated to about 2%, 3%, 4%, and 6% nitrogen. Samples were then laundered one, six, and twelve times, mercerized, or subjected to simulated vat dyeing, and examined for thread count, weight, thickness, elongation, stiffness, moisture regain, and resistance to flat and flex abrasion. Groups of similar samples were exposed to 160° C. heat for periods of three and seven days and soil burial tests for six and 12 weeks.

ELECTRONIC HEATING FOR INDUSTRY—*Young Brothers Co, Dept D-26, 1831 Columbus, Cleveland 13, O*—The method of heating, baking, drying or curing nonmetallic, nonconductive material, known as dielectric or *electronic* heating, is described in Bulletin 56-E.

In this method, heat is developed uniformly throughout a homogeneous material as its molecules react violently to high frequency radio energy generated by an electronic tube. This energy is directed into the material by a pair of electrodes between which the material passes on a continuously moving conveyor.

Since the heat is developed uniformly within the material, the rate of heating is said to be greatly accelerated over rates obtained by radiant or convection heating methods. It is claimed that dielectric heating can frequently reduce heating or baking time to minutes—or even seconds.

Bulletin 56-E also describes and pictures standard models of Young Brothers dielectric ovens and heaters and gives their dimensions and power output ratings.

EMERSOFT 7700—*Emery Industries, Inc, Dept 5, Carew Tower, Cincinnati 2, Ohio*—Technical Bulletin No. 407 describes Emersoft® 7700, a new nonionic softener. The 8-page booklet lists properties and test procedures for the product, as well as application data for use in the finishing of most cottons.

FASTUSOL BLUE L6GA — *General Dyestuff Co, 435 Hudson St, New York 14, NY*—Circular G-795 covers Fastusol Blue L6GA, a straight, direct dyestuff, which is said to offer exceptional economy and level-dyeing properties. It gives fast-to-light, bright greenish blues on cotton and rayon. It is recommended by GDC for textiles that are to receive a resin finish and is suitable also for discharge work.

G-795 discusses Properties (shade and fastness, dischargeability, and dyeing properties); Uses; Application; and Fastness Ratings. Sample dyeings involving cotton sheeting, rayon crepe, viscose-acetate check, and multifibers on rayon are included.

FILTER PUMP UNITS—*Sethco Mfg Co, 70-78 Willoughby St, Brooklyn 1, NY*—Bulletin 102 (8 pages) describes Sethco's newly designed filter pumps for highly corrosive solutions.

Various plastics—lucite, rigid PVC, polyethylene, etc and corrosion-resistant metals are used. Pumps are said to be self-priming, leak proof, centrifugal type, all plastic, incorporating backwashing features. It is claimed that particles down to one micron can be removed from solutions.

Specific filtration equipment is described for solving special problems. Photos show pumps in action. Complete price sheets are enclosed.

GENERAL DATA AND PHYSICAL-CHEMICAL PROPERTIES OF ARNEL—*Textile Division, Celanese Corp of America, PO Box 1414, Charlotte 1, NC*—Properties of Arnel triacetate yarns and fibers, together with types of filament, staple and tow being produced, are reviewed in technical bulletin TD-12A, which presents new findings on electrical properties of Arnel with particular reference to resistivity as applied to industrial uses. Strength and elongation properties at various temperatures ranging from 68° to 446° F, and effects of dry heat aging are also presented. Information on chemical resistance to Arnel is shown together with analytical procedures for separating Arnel from other fibers.—*16 pages.*

GOVERNMENT SHADES LEAFLET ON KHAKI M-107, 10-OZ TROPICAL WOOL—*Sandoz Chemical Works, Inc, 61-63 Van Dam St, New York 13, NY*—A formula for matching the government's standard M-107 Khaki shade on 10-oz tropical worsted in accordance with Military Specification JAN-C-391 has been released by Sandoz Chemical Works, Inc. The shade is matched with the Omega Chrome series and other dyestuffs compatible with chrome colors. Ask for bulletin T-677.

GLYCERINE PROPERTIES AND USES—*Glycerine Producers' Association, 295 Madison Ave, New York 17, NY*—Chemical and physical properties and the many diverse industrial applications of glycerine are described in this 17-page illustrated booklet.

The booklet, designed as a handy reference to glycerine's role in industry, is divided roughly into two parts. One is a brief technical discussion of glycerine's chemistry and its unique combination of physical properties that make it one of the most widely used chemical materials. The other consists of concise summaries of glycerine's function in its principal industrial applications.

The chemical section explains that glycerine's versatility as a chemical building block accounts for approximately one-half of its industrial consumption, now running above 225 million pounds a year in the United States.

A feature of the booklet is a two-page table showing glycerine's function in 52 principal industrial applications.

Other information included in the booklet is a summary of glycerine grades and definitions.

GLYCERINE — TERMS, TESTS, TECHNICAL DATA—*Glycerine Producers' Association, 295 Madison Ave, New York 17, NY*—This new 19-page booklet describes the commercial grades, definitions, specifications, test methods, and shipping and storage requirements of glycerine.

Specifications covering classification, physical and chemical requirements, test procedures, packaging, storage and use are presented.

The complete sodium periodate oxidation method, AOCS Official Method Ea 6-51, for the determination of glycerine is described.

The booklet also provides information on glycerine containers and shipping and the handling and storing of refined glycerine. A table lists the specific gravity for glycerine concentrations ranging from 1 to 100%.

HINNEKENS CATALOG—*Hinnekens Machine Co, Inc, 199-221 Godwin Ave, Paterson, NJ*—Featured in this 60-page catalog of textile dyeing and finishing machinery are such Hinnekens machines as the continuous boil-off, dye beck, jigs, calenders, embossing machines, etc. Profusely illustrated with photographs and blueprints.

HOT LIME-ZEOLITE SOFTENERS—*Cochrane Corp, 17th St below Allegheny Ave, Philadelphia 32, Pa*—This bulletin (Publication 4801-A) stresses the versatility and economy of Cochrane hot lime-zeolite softeners. It deals with method of operation, expected results, chemical savings and simplicity of operation and points out that, with the addition of the zeolite stage, the application of hot process to water conditioning is practically limitless.

HOW AMERICAN STANDARDS ARE MADE—*Dept PR, American Standards Association, 70 East 45th St, New York 17, NY*—This booklet describes the three ways standards become nationally-accepted and approved as American Standards. Tells who makes these American Standards and why, and who uses them.

Explains what the American Standards Association is, how it guards the democratic processes through which American Standards are developed, and how it operates impartially for the manufacturer, the consumer and the general public.

INVESTIGATION OF SELECTED CHEMICALLY ALTERED COTTON MATERIALS—*E L Hamilton, Wright Air Development Center. Feb, 1956. 26 pages. 75 cents. (Order PB 121215 from OTS, U S Department of Commerce, Washington 25)*—Research was undertaken to find the level of alteration by acetylation which gave adequate resistance to fungi, yet retained desired physical properties. Cotton acetylated at 12.6 plus or minus 0.4 percent level in an 8 ounce or lower weight fabric was found to be the best degree of alteration of those evaluated. Ten and 12 ounce fabrics altered at the same level did not possess adequate fungus resistance. Preliminary testing of cyanoethylated cotton in a 3.6 ounce weight fabric with a 3.6 percent nitrogen content showed that satisfactory fungus resistance could be obtained by cyanoethylation.

JET MOGENIZER®—*Buschman Products Inc, 369 Lexington Ave, New York 17, NY*—This 4-page bulletin discusses Buschman's new Jet Mogenizer, which combines the effects of both colloid mill and homogenizer. Characteristics of the unit, principles of its operation, a discussion of flash homogenizing, and its application to textiles, pulp and paper, chemicals and paints are covered.—Illustrated.

2-METHYL-5-ETHYL PYRIDINE — *Carbide and Carbon Chemicals Co, 30 East 42nd St, New York 17, NY*—Information is given on properties, specifications, shipping data, and applications. Typical reactions of 2-methyl-5-ethyl pyridine are also described.

The chemical is used as an intermediate for vinyl pyridines used in the manufacture of certain synthetic fibers. It is a solvent and reaction medium for the manufacture of dyestuffs.

Ask for Bulletin F-7621.

PAREX SYSTEM FOR SINGEING EFFICIENCY—*Ernest Turner & Co (Salford) Ltd, Salford 5, Lancashire, England*—This well-illustrated 10-page brochure covers the Parex system in detail, discussing what it is, its advantages, models, and auxiliary equipment.

PLASTICIZERS — *Kessler Chemical Co, Inc, State Rd & Cottman Ave, Philadelphia 35, Pa*—Properties and specifications of fifteen plasticizers are listed, including methoxyethyl, butoxyethyl, butyl and octyl esters, phthalates, adipates, stearates, oleates and laurates. Performance data with polyvinyl chloride are presented along with recommendations for use with cellulose resins, polystyrene and synthetic rubber. Extensive charts and graphs are included on solubility, resin compatibility and viscosity-temperature relationships.—*48 pages.*

PRESSURE-SENSITIVE TAPE APPLICATIONS IN THE TEXTILE AND APPAREL INDUSTRIES — *Minnesota Mining and Manufacturing Co, Dept L6-278, 900 Fauquier St, St Paul 6, Minn*—This 19-page manual describes pressure-sensitive tape applications designed to save time and up production in the textile and apparel industries.

The manual, which illustrates more than 60 different "Scotch" brand tape applications, is broken down to cover five manufacturing phases within the textile and apparel field, including production of yarn, cloth, garments and apparel, carpets and rugs and cloth finishing. Also covered are tape applications for packaging and product promotion.

Other sections of the manual describe physical properties of "Scotch" brand pressure-sensitive tapes, the various dispensers for use in the textile industry and the customer service available from 3M's technical departments.

PROCTOR LABORATORY SKEIN AND SWATCH DRYER — *Proctor & Schwartz, Inc, 7th St & Tabor Rd, Philadelphia 20, Pa*—Bulletin 416 illustrates and provides general information on this unit, which is used principally in dyehouses where it is desired to dry samples under conditions similar to actual production drying. It is also suitable for use by research laboratories and textile schools.

SCAV-OX—*Industrial Chemicals Div, Olin Mathieson Chemical Corp, Baltimore 3, Md*—Scav-Ox, a new 35 percent hydrazine solution for removing dissolved

oxygen from boiler feedwater, is described in this 16-page illustrated booklet.

The booklet covers in detail the use of Scav-Ox for protecting low-, medium- and high-pressure boilers. It discusses determination of dosage, recommended methods of application, testing methods for hydrazine, and properties and handling of the material. Comprehensive operating data are presented in the form of case studies in each of the three boiler classes.

Scav-Ox was introduced by Olin Mathieson earlier this year as a new form of hydrazine with improved handling characteristics. It reportedly has no flash point and no fire point, yet retains all of the advantages of hydrazine as an oxygen scavenger and corrosion inhibitor.

SYNTHETIC ORGANIC CHEMICALS, UNITED STATES PRODUCTION AND SALES (1955)—*65¢; Supt of Documents, Government Printing Office, Washington 25, DC*—The U S Tariff Commission has released its annual report on the production and sales of synthetic organic chemicals in 1955 (Report No. 198, Second Series).

The combined production of all synthetic organic chemicals and their raw materials as a group is reported by the Commission to be 74,949 million pounds in 1955—22 percent more than the 61,507 million pounds reported for 1954. Total sales in 1955 amounted to 43,090 million pounds, valued at 5,590 million dollars, compared with 34 707 million pounds, valued at 4,537 million dollars, in 1954. These figures represent totals for chemical raw materials, and semifinished and finished products, and therefore involve considerable duplication. Preliminary reports were issued earlier this year covering the production and sales in 1955 of the several individual groups of organic chemicals and their raw materials.

The statistics given in the final report, the thirty-ninth issued on the organic chemical industry by the Commission, were compiled from data submitted by 626 manufacturing companies and company divisions. The report covers more than 6,000 individual chemical products, and gives production and sales statistics for many of them. Also shown in the report is a list of the manufacturers of each item on which production or sales were reported, and statistics on United States general imports of products entered during 1955 under paragraphs 27 and 28 of the Tariff Act of 1930, which cover coal-tar intermediates, dyes, medicinals, and other finished coal-tar products. In addition, the report gives statistics on the number of technical workers engaged in research in the industry, their average salaries, and the amounts expended for research on synthetic organic chemicals by the reporting companies.

The report comprises three major sections—chemical raw materials, cyclic intermediates, and finished synthetic organic chemical products. The first section on chemical raw materials and related products includes statistics on tar, tar crudes, and crude chemicals derived from petroleum and natural gas. The combined production of coal tar, water-gas tar, and oil-gas tar in 1955 amounted to 914 million gallons, compared with 766 million gallons reported for 1954. Production of all tar crudes in 1955 amounted to 14,292 million pounds—20 per cent more than the 11,957 million pounds produced in 1954. The most important individual products in this group are benzene, toluene, xylene, naphthalene, and creosote oil. Output of crude products from petroleum and natural gas in 1955 was 16,179 million pounds reported for 1954. Such products include benzene, toluene, and xylene and such aliphatic hydrocarbons as ethylene, propane, and 1,3-butadiene, one of the basic ingredients of GR-S type synthetic rubber.

Production of cyclic intermediates in 1955, given in the second section of the report, amounted to 6,017 million pounds —30 percent more than the production of cyclic intermediates in 1954. As in previous years, over 60 percent of the production of intermediates was used by the original producers in the manufacture of more advanced products, the remainder being sold to other companies for further processing.

The third section of the report shows that the output of all finished organic chemicals and chemical products as a group in 1955 amounted to 29,317 million pounds, compared with 23,831 million pounds in 1954. Of this total, finished cyclic products in 1955 accounted for 6,107 million pounds, and acyclic products for 23,211 million pounds. The production in 1955 of each individual group of synthetic organic chemicals covered in this section was greater than in 1954. The respective groups and the percentages by which the output in 1955 exceeded that in 1954 are as follows: Elastomers (54 percent); rubber-processing chemicals (36 percent); plastics and resin materials (32 percent); plasticizers (32 percent); pesticides and other organic agricultural chemicals (21 percent); medicinals (20 percent); flavor and perfume materials (19 per cent); dyes (17 percent); surface-active agents (12 percent); and toners and lakes (11 percent); and the miscellaneous group of chemicals (20 percent).

VAT COLOR EDUCATIONAL MATERIAL—The following material on vat colors is available from the companies listed:

"It Pays to Know These Facts About Vat Dyes"—Dyestuffs Dept, American Cyanamid Co, Bound Brook, NJ

"Around the World Color Tour"—Arnold Hoffman Co, Inc, 55 Canal St, Providence, RI

"A Brief History of Dyes"; "Harnessing the Rainbow for You"; and "Modern Dyestuffs and their Properties"—E I du Pont de Nemours & Co, Inc, Dyes and Chemicals Div, Wilmington 98, Del.

"What's Your Score on Vat Dyes?"; "Your Guide to Selling Color that Lives in Decorative Fabrics"; and "The Vat Color Story" — USF-Aspinook-Arnold, 261 Fifth Ave, New York 16, NY

WATER REPELLENT THREAD FOR MILITARY ITEMS—*E B Frederick and W Zagieboylo, Quartermaster Research and Development Center, U S Army. June, 1955. 25 pages. 75 cents. (Order PB 121114 from OTS, U S Department of Commerce, Washington 25)* — Laboratory studies of cotton thread treated with a commercial ester-type durable water repellent compound showed water absorption of the thread reduced from 58 to 27 percent. Similar results were found in pilot-plant studies, plant runs and production trials. Sewing efficiency was not affected by the treatment. Seams of water resistant clothing were sewed with the treated thread with no detection of seam leakage. Protection lasted 7¼ hours. In contrast, untreated seams leaked after 15 minutes of exposure.

General Calendar

AMERICAN ASSOCIATION FOR TEXTILE TECHNOLOGY, INC
Dec 5 (Meeting at the Vanderbilt Hotel, New York, N Y).

AMERICAN CHEMICAL SOCIETY (CLEVELAND AND CHICAGO SECTIONS)
Nov 27-30 (9th National Chemical Exposition, Cleveland Public Auditorium Cleveland, Ohio).

AMERICAN OIL CHEMISTS SOCIETY
Spring, 1957 (Spring meeting, New Orleans); Sept 30-Oct 2, 1957 (Fall meeting, Cincinnati); Apr 21-23, 1958 (Memphis); Oct 20-22, 1958 (Chicago); Spring, 1959 (New Orleans); Fall, 1959 (Los Angeles).

AMERICAN SOCIETY FOR QUALITY CONTROL
Feb 25-27—7th Annual Conference of the Textile Division, Georgia Tech, Atlanta, Ga.

THE DRYSALTERS CLUB OF NEW ENGLAND
Jan 21 (Hotel Somerset, Boston); Apr 26 (Hotel Vendome, Boston); June 21 (Annual Outing—Wachusett Country Club, West Boylston, Mass).

THE FIBER SOCIETY
Spring Meeting—May 1-2, 1957, The Clemson House, Clemson, S C

NATIONAL COTTON COUNCIL OF AMERICA
Feb 28-Mar 1 (Cotton Research Clinic, General Oglethorpe Hotel, Savannah, Ga).

PHI PSI FRATERNITY
April 25-27—Annual meeting, New Bedford Hotel, New Bedford, Mass.

TEXTILE QUALITY CONTROL ASSOCIATION
March 28-29 (Spring Meeting, Clemson House, Clemson, SC)

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